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AN EPIDEMIOLOGIC INVESTIGATION OF HEALTH EFFECTS IN AIR
FORCE PERSONNEL F (U) SCIENCE APPLICATIONS
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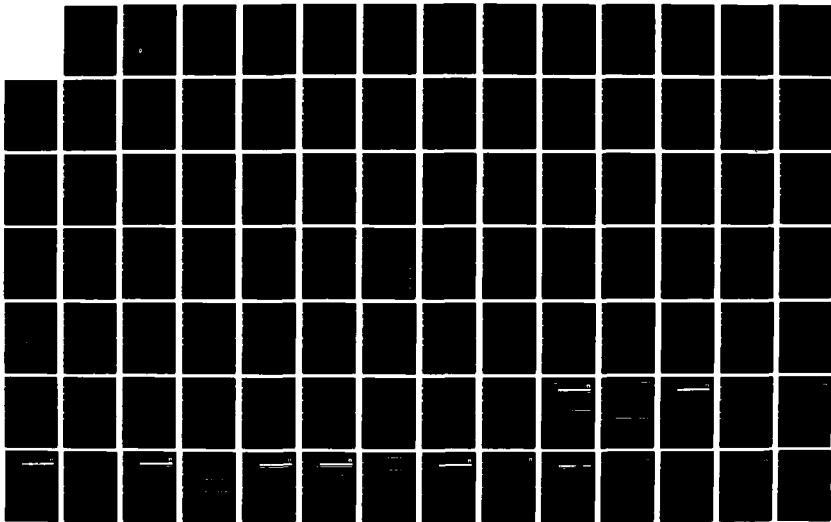
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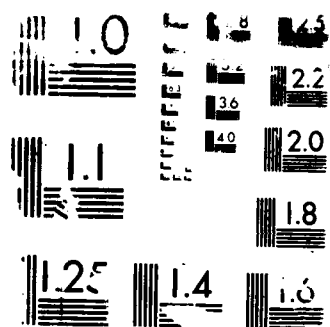
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Air Force Health Study

An Epidemiologic Investigation of Health Effects in Air Force Personnel Following Exposure to Herbicides

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APPENDIX A

Advisory Committee on Special Studies Relating to the Possible Long-Term Health Effects of Phenoxy Herbicides and Contaminants

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Relating to the Possible Long-Term Health Effects
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APPENDIX B
Questionnaire Methodology

TABLE B-1.

Elements of the Interval Questionnaires

| Type | Method | Elements |
|------------------------------------|--------------|---|
| Participant Interval Questionnaire | In Person | Demographic, educational, occupational, toxic exposures, reproductive experience, medical |
| Spouse* Interval Questionnaire | By Mail | Comprehensive reproductive history |
| Baseline Participant Questionnaire | In Person | Demographic, educational, occupational, medical, compliance, toxic exposures, and reproductive experience |
| Baseline Spouse* Questionnaire | In Person | Comprehensive reproductive history |
| Telephone Survey | By Telephone | Self-perception of health: current medications, severity of recent illness, absenteeism, income level |

*Present, former, or partner.

Participant Interval Questionnaire

4428Sec-1

BEFORE INTERVIEW

-1-

TIME 10-13/
BEGAN AM PM

SECTION 1: INTRODUCTION

This part of the study asks about the health of current and former Air Force Members and their families.

At various points in the questionnaire, we will be using the term "biological" to describe family relationships. For example, we might ask about your "biological" children. When we use this term, we do not mean your step-children or step-parents or people related to you through adoption. We mean people related to you by blood.

You may refuse to answer any question you choose. However, we and the Air Force ask that you answer as many of the questions as you can, so the results will accurately and fully tell your story. I'd also like to emphasize that we need as accurate a picture as you can remember. So when we ask you about the dates of events in your life, please think carefully.

First I have a few background questions to ask you.

1. My records indicate that your date of birth is (DATE OF BIRTH, FROM INFORMATION SHEET, ITEM 1). Is that correct?

Yes 14/
No (CORRECT INFORMATION SHEET, AND GO TO Q.2)....2

2. Do you remember the month and year you were interviewed the last time for this study? We are talking about the interview in your home before you went for your physical exam.

- A. Was it in 1981 or 1982? (RECORD ON INFORMATION SHEET)
- B. What month did the interview take place? (RECORD ON INFORMATION SHEET. IF A CAN'T REMEMBER EXACT MONTH ASK C)

- C. Was it in the Spring, Summer, Fall or Winter? (INTERVIEW. IF SPRING, RECORD ON INFO SHEET AS MARCH IF SUMMER, RECORD ON INFO SHEET AS JUNE IF FALL, RECORD ON INFO SHEET AS SEPTEMBER IF WINTER, RECORD ON INFO SHEET AS DECEMBER)

INTERVIEWER: CONTINUE TO FILL OUT FROM THE RESPONDENT ANY OTHER BLANK OR MISSING INFORMATION FROM THE INFORMATION SHEET. RECORD ON THE INFORMATION SHEET.

DEKES 01-02

-2-

3. INTERVIEWER: ASK A FOR RESPONDENT, THEN ASK B AND C FOR PARENTS

| A. RESPONDENT | B. FATHER | C. FATHER |
|--|---|---|
| To which of the following racial or ethnic groups do you belong? (CODE ALL THAT APPLY) (PROBE: What others?) | To which of the following racial or ethnic groups does your biological mother belong? (CODE ALL THAT APPLY) (PROBE: What others?) | To which of the following racial or ethnic groups does your biological father belong? (CODE ALL THAT APPLY) (PROBE: What others?) |
| English/Welsh.....01 15-16/ | English/Welsh.....01 51-52/ | English/Welsh.....01 16-17/ |
| Scottish.....02 17-18/ | Scottish.....02 53-54/ | Scottish.....02 18-19/ |
| German.....03 19-20/ | German.....03 55-56/ | German.....03 20-21/ |
| Irish.....04 21-22/ | Irish.....04 57-58/ | Irish.....04 22-23/ |
| Scandinavian.....05 23-24/ | Scandinavian.....05 59-60/ | Scandinavian.....05 24-25/ |
| Polish.....06 25-26/ | Polish.....06 61-62/ | Polish.....06 26-27/ |
| Russian.....07 27-28/ | Russian.....07 63-64/ | Russian.....07 28-29/ |
| Other Slavic.....08 29-30/ | Other Slavic.....08 65-66/ | Other Slavic.....08 30-31/ |
| Jewish.....09 31-32/ | Jewish.....09 67-68/ | Jewish.....09 32-33/ |
| French.....10 33-34/ | French.....10 69-70/ | French.....10 34-35/ |
| Italian.....11 35-36/ | Italian.....11 71-72/ | Italian.....11 36-37/ |
| Spanish.....12 37-38/ | Spanish.....12 73-74/ | Spanish.....12 38-39/ |
| Mexican.....13 39-40/ | Mexican.....13 75-76/ | Mexican.....13 40-41/ |
| Greek.....14 41-42/ | Greek.....14 77-78/ | Greek.....14 42-43/ |
| American Indian.....15 43-44/ | American Indian.....15 79-80/ | American Indian.....15 44-45/ |
| Asian.....16 45-46/ | Asian.....16 10-11/ | Asian.....16 46-47/ |
| African.....17 47-48/ | African.....17 12-13/ | African.....17 48-49/ |
| Other (SPECIFY) | Other (SPECIFY) | Other (SPECIFY) |
|18 49-50/ |18 14-15/ |18 50-51/ |

NAME
CARD
A

5. (Continued)

3. Have you served in the military (at all) since (DATE OF LAST INTERVIEW)

Yes.....1 49/

No.....(SKIP TO SECTION 3).....2

4. Are you currently serving in the military?

Yes.....1 50/

No.....2

5. Now, let's talk about any military and specialized training programs that prepared you for a major change in your occupation. Since (DATE OF LAST INTERVIEW), (and besides the formal schooling and job training programs you've told me about), have you participated in any military technical or specialized training programs that prepared you for a major change in your career?

Yes.....(ASK A-E).....1 51/

No.....(SKIP TO SECTION 3).....2

| 1ST PROGRAM | 2ND PROGRAM | 3RD PROGRAM |
|--|--|--|
| A. For what kind of work was your first military training program preparing you? | F. For what kind of work was your second military training program preparing you? | E. For what kind of work was your third military training program preparing you? |
| B. What is the AFSC for that job? | G. What is the AFSC for that job? | L. What is the AFSC for that job? |
| C. In what month and year did you start this training? | H. In what month and year did you start this training? | M. In what month and year did you start this training? |
| D. In what month and year did you complete this training? | I. In what month and year did you complete this training? | N. In what month and year did you complete this training? |
| CURRENTLY IN TRAINING...1 | | |
| E. Have you participated in any other military job training program that prepared you for a major change in your occupation? | J. Have you participated in any other military job training program that prepared you for a major change in your occupation? | O. Have you participated in any other military job training program that prepared you for a major change in your occupation? |
| Yes...(ASK F)...1 65/ | Yes...(ASK J)...1 79/ | Yes...(ASK O)...1 23/ |
| No.....2 | No.....2 | No.....2 |
| 24-27/R | | |

3. While you were on that job, how often (do/did) you wash to remove the (SUNSTAINES) or use protective gear -- would you say all of the time, some of the time, or never?

- All of the time.....1 32/
- Some of the time.....2
- Never.....(SKIP TO Q.5).....3

4. Which of the following (do/did) you use on that job? (CHECK ALL THAT APPLY)

- Air filter.....01 33-34/
- Goggles.....02 35-36/
- Face shield.....03 37-38/
- Special clothing.....04 39-40/
- Washing facilities.....05 41-42/
- Self-contained or supplied air breathing apparatus.....06 43-44/
- None.....07 45-46/

HAND CARD E

5. Did you have another job before the job with (NAME IN Q.1A) but, since (DATE OF LAST INTERVIEW) that lasted 3 months or longer?

- Yes.....1 47/
- No.....(SKIP TO Q.21).....2

6. In what month and year did you start that job?

Month Year 48-51/

A. What was the name of your employer?

52-76/

B. Was this a full-time or part-time job?

- Full-time.....1 77/
- Part-time.....2

6. (Continued)

6. (Continued)

C. What kind of business was that--what did they make or do there?

10-12/

D. What did you actually do on the job--what were some of your main duties?

13-15/

E. Please look at this card and tell me which number best describes the kind of industry you worked in? (WRITE IN NUMBER)

HAND CARD C

ENTER NUMBER, 16-17/

F. In what month and year did this job end?

Month Year 18-21/

CURRENT JOB:.....(SKIP TO Q.7).....0001

G. What was the main reason you stopped working on your job?

22-23/

11. (Continued)

F. In what month and year did this job end?

| | |
|-------|------|
| Month | Year |
| 1 | 1 |

CURRENT JOB.....(SKIP TO Q.12).....0001

G. What was the main reason you stopped working on your job?

48-49/

12. While working at (EMPLOYER) did you come in contact with any of the substances on this card? By contact I mean that you inhaled, tasted, had skin contact with these fibers and chemicals, or were exposed to ionizing or nuclear radiation.
(COME ALL THAT APPLY)

A. In general how many days a month did you come in contact with (SUBSTANCE)?
Less than once a month

- | | | | | | |
|---|--------|---|------|---------|--------|
| Asbestos.....01 | 50-51/ | 1 | days |95 | 52-53/ |
| Ionizing or nuclear radiation....02 | 54-55/ | 1 | days |95 | 56-57/ |
| Industrial chemicals.....03 | 58-59/ | 1 | days |95 | 60-61/ |
| Insecticides or pesticides.....04 | 62-63/ | 1 | days |95 | 64-65/ |
| Degreasing chemicals.....05 | 66-67/ | 1 | days |95 | 68-69/ |
| Defoliant or herbicides.....06 | 70-71/ | 1 | days |95 | 72-73/ |
| None of the above (SKIP TO Q.15).....07 | 74-75/ | | | | |

13. While you were on that job, how often did you wash to remove the (SUBSTANCE) or use protective gear -- would you say all of the time, some of the time, or never?

- | | |
|--------------------------------|-----|
| All of the time.....1 | 76/ |
| Some of the time.....2 | |
| Never.....(SKIP TO Q.15).....3 | |

14. Which of the following did you use on that job? (COME ALL THAT APPLY)

- | | |
|---|--------|
| Air filter.....01 | 10-11/ |
| Goggles.....02 | 12-13/ |
| Face shield.....03 | 14-15/ |
| Special clothing.....04 | 16-17/ |
| Washing facilities.....05 | 18-19/ |
| Self-contained or supplied air breathing apparatus.....06 | 20-21/ |
| None.....07 | 22-23/ |

15. Did you have another job before job with (NAME IN Q.11A), but since (DATE OF LAST INTERVIEW)?

- | | |
|------------------------------|-----|
| Yes.....1 | 24/ |
| No(SKIP TO Q.21).....2 | |

16. In what month and year did you start that job?

| | |
|-------|------|
| Month | Year |
| 1 | 1 |

A. What was the name of your employer?

B. Was this a full-time or part-time job?

- | | |
|-----------------|-----|
| Full-time.....1 | 54/ |
| Part-time.....2 | |

C. What kind of business was that--what did they make or do there?

55-57/

16. (Continued)

SECTION 4: MILITARY

1. Now I am going to ask you about some of your experience in the military. First, which of the following statements best describes your assignment during the Vietnam War?

A crew member in Vietnam who was on a flying status.....1 45/
 Not a crew member, but flew one or more missions in Vietnam..2
 A crew member, but did not log flying time in Vietnam.....3
 Not a crew member.....4

HAND
CARD
P

2. INTERVIEWER: HAS R SERVED IN MILITARY SINCE LAST INTERVIEW? (IS Q.3 IN SECTION 2, CODED "YES")

YES.....(GO TO Q.3).....1 46/
 NO.....(SKIP TO SECTION 5).....2

3. Since (DATE OF LAST INTERVIEW) have you retired, been discharged or separated from the (BRANCH OF SERVICE FROM INFORMATION SHEET ITEM 3)?

Yes.....(ASK A THROUGH C).....1 47/
 No.....(SKIP TO Q.4).....2

- A. Were you retired, discharged or separated?

Retired.....1 48/
 Discharged/Seperated.....2

- B. In what month and year were you (retired/discharged/separated) from the (BRANCH OF SERVICE FROM INFORMATION SHEET ITEM 3)?

Month Year 49-52/

3. (Continued)

- C. Following your (retirement/separation/discharge) in (DATE IN B.), did you reenter the armed forces?

Yes.....1 53/
 No.....2

4. I would like to ask you the names of all the countries, including the United States, you have been stationed in since (DATE OF LAST INTERVIEW)

When last interviewed you were stationed in (COUNTRY FROM INFORMATION SHEET ITEM 3), and your assignment began in (DATE OF ASSIGNMENT FROM INFORMATION SHEET ITEM 3). Is that correct?

Yes....(ASK B THROUGH K).....1 54/
 No....(CORRECT INFORMATION SHEET, THEN ASK B THROUGH K).....2

4. (Continued)

G. In your job assignments while stationed in (COUNTRY), (do/did) you come in contact with any of the substances on this card? By contact I mean that you inhaled, tasted, had skin contact with these fibers and chemicals, or were exposed to ionizing or nuclear radiation. CODE ALL THAT APPLY

HAND CARD D

asbestos.....01
50-51/
ionizing or nuclear radiation.....02
52-53/
industrial chemicals.....03
54-55/
insecticides or pesticides.....04
56-57/
degreasing chemicals.....05
58-59/
defoliants or herbicides.....06
60-61/
none of the above (SKIP TO K).....07
62-63/

H. In your job assignments while stationed in (COUNTRY), (do/did) you come in contact with any of the substances on this card? By contact I mean that you inhaled, tasted, had skin contact with these fibers and chemicals, or were exposed to ionizing or nuclear radiation. CODE ALL THAT APPLY

HAND CARD D

asbestos.....01
64-65/
ionizing or nuclear radiation.....02
66-67/
industrial chemicals.....03
68-69/
insecticides or pesticides.....04
70-71/
degreasing chemicals.....05
72-73/
defoliants or herbicides.....06
74-75/
none of the above (SKIP TO V).....07
76-77/

I. In your job assignments while stationed in (COUNTRY), (do/did) you come in contact with any of the substances on this card? By contact I mean that you inhaled, tasted, had skin contact with these fibers and chemicals, or were exposed to ionizing or nuclear radiation. CODE ALL THAT APPLY

HAND CARD D

asbestos.....01
10-11/
ionizing or nuclear radiation.....02
12-13/
industrial chemicals.....03
14-15/
insecticides or pesticides.....04
16-17/
degreasing chemicals.....05
18-19/
defoliants or herbicides.....06
20-21/
none of the above (SKIP TO G).....07
22-23/

M. In general, how many days a month (do/did) you come in contact with (SUBSTANCE)?

asbestos 24-25/
less than once a month.....95
ionizing or nuclear radiation 26-27/
less than once a month.....95
industrial chemicals 28-29/
less than once a month.....95
insecticides or pesticides 30-31/
less than once a month.....95
degreasing chemicals 32-33/
less than once a month.....95
defoliants or herbicides 34-35/
less than once a month.....95

1. Did you wash to remove the (SUBSTANCES) or did you use protective clothing or gear when stationed in (COUNTRY) all the time, some of the time, or never?

All the time.....1 36/
Some of the time....2
Never.(SKIP TO K)....3

N. In general, how many days a month (do/did) you come in contact with (SUBSTANCE)?

asbestos 37-38/
less than once a month.....95
ionizing or nuclear radiation 39-40/
less than once a month.....95
industrial chemicals 41-42/
less than once a month.....95
insecticides or pesticides 43-44/
less than once a month.....95
degreasing chemicals 45-46/
less than once a month.....95
defoliants or herbicides 47-48/
less than once a month.....95

T. Did you wash to remove the (SUBSTANCES) or did you use protective clothing or gear when stationed in (COUNTRY) all the time, some of the time, or never?

All the time.....1 49/
Some of the time....2
Never.(SKIP TO V)....3

O. In general, how many days a month (do/did) you come in contact with (SUBSTANCE)?

asbestos 50-51/
less than once a month.....95
ionizing or nuclear radiation 52-53/
less than once a month.....95
industrial chemicals 54-55/
less than once a month.....95
insecticides or pesticides 56-57/
less than once a month.....95
degreasing chemicals 58-59/
less than once a month.....95
defoliants or herbicides 60-61/
less than once a month.....95

EE. Did you wash to remove the (SUBSTANCES) or did you use protective clothing or gear when stationed in (COUNTRY) all the time, some of the time, or never?

All the time.....1 62/
Some of the time....2
Never.(SKIP TO G)....3

F. In what month and year did you get married to (NAME)?

ENTER MONTH AND YEAR

MO YR

44 44

44-51/

2. Have you stopped living with (NAME)?

Yes.....(ASK A).....1 52/
No.....(SKIP TO C).....2

A. How did this (marriage/relationship) end?

| | |
|---|-----|
| SEPARATION.....1 | 53/ |
| DIVORCE.....2 | |
| DEATH OF SPOUSE OR PARTNER.....(AMT B-2) YRMS AMT D.3).....3 | |

B. In what month and year did this occur?

ENTER MONTH AND YEAR: [] [] [] [] 54-57/
MO YR

C. During this (marriage/relationship), how many times were you living apart from (NAME) for 3 months or more since (DATE OF LAST INTERVIEW)?

ENTER NUMBER OF TIMES: | | | | | 58-59/

3

MONS.....(SKIP TO 7).....00

D. For how many months did you live apart the (first/next) time?

| | | |
|--------|----|--------------|
| 60-61/ | 11 | First time: |
| 62-63/ | 11 | Second time: |
| 64-65/ | 11 | Third time: |
| 66-67/ | 11 | Fourth time: |

2. (continued)

F. During this (marriage/relationship), [since the (DATE OF LAST INTERVIEW)], did you ever have a problem conceiving a child because of prolonged sterility?

Yes.....1

No.....2

7. And what is (NAME OF SPOUSE/PARTNER)'s present street address?

STREET ADDRESS

g. And what city, state and zip code does (SPOUSE/PARTNER) live in?

| CITY | STATE | ZIP | CODE |
|--------|--------|-----|--------|
| 35-54/ | 35-36/ | | 57-61/ |

11. And what is (NAME of SPOUSE/PARTNER)'s present telephone number?

AREA CODE _____ NUMBER _____ 62-71/

NO PHONE.....!

1. Thinking of all the people you know, who would be the one person who would be most likely to know where (NAME OF SPOUSE/PARTNER) is? ENTER FULL NAME OF PERSON BELOW AND ASK J-N.

BEGIN DECK 15
10-29/

(LAST).

30-44/

(FIRST) (MIDDLE) (LAST)

1). What is (PERSON'S) relationship to (NAME OF SPOUSE/PARTNER)?

I. Where does (PFASOM) live?

STREET ADDRESS _____ APT# _____

CITY _____ STATE _____ ZIP _____ CUDZ _____
10-29/ 30-31/ 32-36/

2. (Continued)

L. What is (PERSON'S) telephone number?

AREA CODE PHONE NUMBER 37-46/

NO PHONE.....1

M. IF (PERSON) HAS PHONE: In whose name is the phone listed?

(PERSON'S) name.....(SKIP TO M).....1 47/

OTHER.....(SPECIFY BELOW).....2

DON'T KNOW.....3

48-72/

(LAST),

(FIRST) (MIDDLE)

N. INTERVIEWER: HAS A STOPPED LIVING WITH SPOUSE OR PARTNER?
(IS "YES" CODED AT Q.37)

Yes.....1 73/

No.....(SKIP TO Q.10).....2

3. Since (DATE OF LAST INTERVIEW), have you reconciled, married (again) or have you lived together as a partner for 3 months or more with someone to whom you weren't married?

Yes.....(ASK A).....1 74/

No.....(SKIP TO Q.10).....2

A. How many times did you get married or live as a partner with someone for 3 months or more since (DATE OF LAST INTERVIEW)?

RECORD NUMBER OF TIMES: 75/

4. Thinking of (that/the first) relationship since (DATE OF LAST INTERVIEW), did you marry this person?

Yes.....1 76/

No.....2

RECONCILED.....3

4. (Continued)

A. What is the current full name of (this person/your wife)?

10 0

77-78/

(LAST)

(FIRST)

(MIDDLE)

INTERVIEWER: RECORD FULL NAME OF (SPOUSE/PARTNER) ON INFORMATION SHEET, ITEM 07 AND RECORD 108 ABOVE.

BEGIN DECK 17

What was her full maiden name?

10-29/

What was her birthdate? RECORD DATE: 30-35/

MO DA YR

B. In what month and year did you (reconcile/get married to/start living with) (NAME)?

ENTER MONTH AND YEAR: 36-39/

MO YR

C. Have you stopped living with (NAME)?

Yes.....(ASK D-P).....1 40/

No.....(SKIP TO Q.47).....2

D. How did this (marriage/relationship) end?

Separation.....1 41/

Divorce.....2

Death of spouse or partner..(ASK B-M, THEN SKIP TO Q.5)....3

2. In what month and year did this occur?

12-451

•

16-0371

None.....(GO TO 1).....00

| | 40-49/ | 50-51/ | 52-53/ | 54-55/ |
|--------------|--------|--------|--------|--------|
| First time: | 11 | 11 | 11 | 11 |
| Second time: | 11 | 11 | 11 | 11 |
| Third time: | 11 | 11 | 11 | 11 |
| Fourth time: | 11 | 11 | 11 | 11 |

35/

57-001

2

•

AND PHONE.....

L. Thinking of all the people you know, either around here or elsewhere, who would be the one person who would be most likely to know where (NAME of SPOUSE/PARTNER) let ENTER FULL NAME OF PERSON BELOW AND AGE M-P.

159-651

56-1001

W. Where does (PEAS(W)) 11797

2-16/

1

| AREA CODE | PHONE NUMBER | 64-73/ |
|-----------|--------------|--------|
| 111 | 111-1111 | |

NO PHONE.....

"

BEGIN DECK 20

(LAST).

| (FIRST) | MIDDLE |
|---------|--------|
| | |

5. INTERVIEWER: IS THERE A SECOND RELATIONSHIP SINCE THE DATE LAST INTERVIEW? (IS NUMBER OF TIMES RECORDED IN 0.1A EQUAL TO 2 OR MORE?)

1.....(4-8 of 09).....222

NO....(SKIP TO Q.10).....?

6. Thinking of the next relationship since (DATE OF LAST INTERVIEW), did you marry this person?

Yes..... 36/
No..... 2

A. What is the current full name of this person?

(LAST) _____ ID # _____
(FIRST) _____ (MIDDLE) _____ 37-38/

INTERVIEWER: RECORD FULL NAME OF (SPOUSE/PARTNER) ON INFORMATION SHEET, ITEM 07 AND 108 ABOVE.

What was her full maiden name?

_____ 39-58/

What was her birthdate? RECORD DATE: _____ MO DA YR 59-64/

B. In what month and year did you (get married to/start living with) (NAME)?

ENTER MONTH AND YEAR: _____ MO YR 65-66/

C. Have you stopped living with (NAME)?

Yes..... (ASK D-P)..... 69/
No..... (BEIP TO F)..... 2

D. How did this (marriage/relationship) end?

Separation..... 70/
Divorce..... 2
Death of spouse or partner (ASK B-G, THEN BEIP TO G-7)..... 3

6. (Continued)

F. In what month and year did this occur?

ENTER MONTH AND YEAR: _____ MO YR 71-74/

F. During this relationship, how many times were you living apart from (NAME) for 3 months or more since (DATE OF LAST INTERVIEW)?

ENTER NUMBER OF TIMES: _____ 75-76/

OR

None..... (GO TO I)..... 00

G. For how many months did you live apart the (first/next) time?

First time..... 77-78/
Second time..... 79-80/
Third time..... 10-11/
Fourth time..... 12-13/

H. During this (marriage/relationship), (since the (DATE OF LAST INTERVIEW)), did you ever have a problem conceiving a child because of prolonged separation?

Yes..... 14/
No..... 2

I. And what is (NAME OF SPOUSE/PARTNER)'s present street address?

STREET ADDRESS _____ 15-19/

J. And what city, state and zip code does (SPOUSE/PARTNER) live in?

CITY _____ STATE _____ ZIP CODE _____
40-59/ 60-61/ 62-66/

6. (Continued)

7. And what is (NAME OF SPOUSE/PARTNER)'s present telephone number?

AREA CODE _____ NUMBER _____ 67 16/

NO PHONE.....1

8. Thinking of all the people you know, either around here or elsewhere, who would be the one person who would be most likely to know where (NAME OF SPOUSE/PARTNER) is? ENTER FULL NAME OF PERSON BELOW AND ASK N.P.

NAME DECK 22
10-29/

(LAST), _____ 30-44/
(FIRST) _____ (MIDDLE) _____

9. What is (PERSON'S) relationship to (NAME OF SPOUSE/PARTNER)?

_____ 45-46/

10. Where does (PERSON) live?

STREET ADDRESS _____ APT. _____ 47-71/
BEGIN DECK 23

CITY _____ STATE _____ ZIP CODE _____
10-29/ 30-31/ 32-36/

11. What is (PERSON'S) telephone number?

AREA CODE _____ PHONE NUMBER _____ 37-46/

NO PHONE.....1

12. If (PERSON) HAS PHONE, in whose name is the phone listed?

(PERSON'S) name.....(SKIP TO Q.7).....1 47/

OTHER.....(SPECIFY BELOW).....2

DON'T KNOW.....(SKIP TO Q.7).....3

(LAST), _____ 48-72/
(FIRST) _____ (MIDDLE) _____

1. INTERVIEWER: IS THERE A THIRD RELATIONSHIP SINCE THE DATE LAST INTERVIEW? (10 NUMBER OF TIMES REMINDED IN Q.3A EQUAL TO 3 OR MORE?)

YES.....(GO TO Q.8).....1 73/
NO.....(SKIP TO Q.10).....2

2. Thinking of the next relationship since (DATE OF LAST INTERVIEW), did you marry this person?

Yes.....1 74/
No.....2

3. What is the current full name of this person?

(LAST) _____ 75-76/
(FIRST) _____ (MIDDLE) _____

INTERVIEWER: RETURN FULL NAME OF (SPOUSE/PARTNER) ON INFORMATION SHEET, ITEM 07 AND ID 8 ABOVE.

What was her full maiden name?

BEGIN DECK 24

_____ 10-29/

What was her birthdate? RECORD DATE: _____ 30-35/
MO DA YR

4. In what month and year did you (get married to/start living with) (NAME)?

ENTER MONTH AND YEAR: _____ 36-39/
MO YR

5. Have you stopped living with (NAME)?

Yes.....(ASK D-2).....1 40/
No.....(SKIP TO F).....2

8. (Continued)

D. How did this (marriage/relationship) end?

NAME CARD G
 Separation.....1 41/
 Divorce.....2
 Death of spouse or partner
 (AGE B-B, YEAR
 SKIP TO Q.9).....3

E. In what month and year did this occur?

ENTER MONTH AND YEAR. 42-45/
 NO IN

F. During this (marriage/relationship), how many times were you living apart from (NAME) for 3 months or more since (DATE OF LAST INTERVIEW)?

ENTER NUMBER OF TIMES. 46-47/

OR

None.....(GO TO Q.9).....00

G. For how many months did you live apart the (first/next) time?

First time..... 48-49/
 Second time..... 50-51/
 Third time..... 52-53/
 Fourth time..... 54-55/

H. During this (marriage/relationship), since the (DATE OF LAST INTERVIEW), did you ever have a problem conceiving a child because of prolonged separation?

Yes.....1 56/
 No.....2

I. And what is (NAME OF SPOUSE/PARTNER)'s present street address?

STREET ADDRESS 57-60/
 BEGIN DECK 25

J. And what city, state and zip code does (SPOUSE/PARTNER) live in?

CITY STATE ZIP CODE 32-36/
 10-29/ 30-31/

9. (Continued)

E. And what is (NAME OF SPOUSE/PARTNER)'s present telephone number?

AREA CODE 37-46/
 NUMBER

NO PHONE1

L. Thinking of all the people you know, either around here or elsewhere, who would be the one person who would be most likely to know where (NAME OF SPOUSE/PARTNER) is? ENTER FULL NAME OF PERSON BELOW AND ASK M.P.

(LAST). 47-71/

(FIRST) (MIDDLE)

M. What is (PERSON'S) relationship to (NAME OF SPOUSE/PARTNER)?

72-73/

N. Where does (PERSON) live?

BEGIN DECK 26

STREET ADDRESS APT# 10-34/

CITY STATE 35-36/ 55-56/ ZIP CODE 57-61/

O. What is (PERSON'S) telephone number?

AREA CODE 62-71/
 PHONE NUMBER

NO PHONE.....1

P. If (PERSON) HAS PHONE, in whose name is the phone listed?

(PERSON'S) name.....(SKIP TO Q.9).....1 72/

OTHER.....(SPECIFY BELOW).....2

DON'T KNOW.....(SKIP TO Q.9).....3

BEGIN DECK 27

(LAST).

10-34/

(FIRST) (MIDDLE)

9. INTERVIEWER: IS THERE A FOURTH RELATIONSHIP SINCE THE DATE LAST INTERVIEW? (IS NUMBER OF TIMES RECORDED IN Q. 1A EQUAL TO 4 OR MORE?)

YES.....(GO TO NEXT QUESTIONAIRE).....1 35/
NO.....2

VERIFICATION OF BIOLOGICAL CHILDREN USING CHILDREN'S SECOND FORM

10. INTERVIEWER: ARE CHILDREN LISTED ON CHILDREN'S SECOND FORM?

YES.....(ASK A).....1 36/
NO.....(ASK B).....2

IF INFORMATION IS CORRECT (GO TO Q. 11).....1 37/
IF INFORMATION IS INCORRECT, MAKE CORRECTIONS ON CHILDREN'S SECOND FORM (THEN GO TO Q. 11).....2

8. Our records show that you had not had any children of your own as of (DATE OF LAST INTERVIEW). Is that correct?

IF INFORMATION IS CORRECT (GO TO Q. 12).....1 38/
IF INFORMATION IS INCORRECT, ASK FOR (CHILD/CHILDREN)'S FULL NAME, SEX, BIRTHDATE AND MOTHER'S NAME. RECORD BEGINNING AT LINE 01 ON CHILDREN'S SECOND FORM.....(THEN GO TO Q. 11).....2

11. INTERVIEWER: ASK THIS QUESTION FOR EACH CHILD LISTED ON CHILDREN'S SECOND FORM FOR WHICH THERE IS NO BIRTH DATE.

What is (NAME OF 1ST CHILD/NAME OF 2ND CHILD, ETC.)'s current age? RECORD ON CHILDREN'S SECOND FORM.

IF DECEASED SINCE LAST INTERVIEW, ASK A-C. OTHERS GO TO Q. 12.
A. When did (CHILD) die? RECORD DAY, MONTH, AND YEAR ON CHILDREN'S SECOND FORM.

B. What was the cause of death? RECORD BELOW.

C. Where is (CHILD)'s death registered? In what city and state? BEGIN LINE 28

CHILD ID: 35-40/ CHILD ID: 60-61/ CHILD ID: 10-11/
CAUSE: 41/ 62/ 12/

REGISTRATION:

(CITY) 42-57/ (CITY) 63-78/ (CITY) 13-28/
(STATE) 58-59/ (STATE) 79-80/ (STATE) 29-30/

12. INTERVIEWER: HAS R BEEN MARRIED OR HAD A PARTNER FOR 3 MONTHS OR MORE SINCE (DATE OF LAST INTERVIEW)?

YES.....(ASK A).....1 31/
NO.....(SKIP TO SECTION 6).....2

A. Has/Have (your wife/any of your partners) become pregnant by you since (DATE OF LAST INTERVIEW)?

Yes.....(ASK B).....1 32/
No.....(SKIP TO Q. 25).....2

B. How many pregnancies (has your wife/have your partners) had with you since (DATE OF LAST INTERVIEW)?

ENTER NUMBER OF PREGNANCIES: 1 1 1 33-34/
(GO TO Q. 13)

14. (continued)

F. Was (CHILD) a twin?

Yes.....1 35/
 No.....2

F. Was (CHILD) premature, full term, or overdue?

Premature.....1 36/
 Full term.....2
 Overdue.....3
 Don't know.....4

G. How old was (NAME OF MOTHER) when (CHILD) was born?

RECORD AGE: 37-39/
 Don't know.....98

H. What is the name and address of the doctor or medical facility who has (CHILD)'s birth registration records? RECORD BELOW

DOCTOR'S NAME OR FACILITY NAME 39/
 STREET ADDRESS

(CITY) (STATE)

INTERVIEWER: RECORD NAME AND ADDRESS ON MEDICAL CONSENT FORM

I. What is the name and address of the doctor or medical facility who has (CHILD)'s current medical records? RECORD BELOW.

DOCTOR'S NAME OR FACILITY NAME 40/
 STREET ADDRESS

(CITY) (STATE)

INTERVIEWER: RECORD NAME AND ADDRESS ON MEDICAL CONSENT FORM

J. What is (CHILD)'s current age? RECORD IN CHILDREN'S RECORD FORM OR SUPPLEMENTARY CHILDREN'S RECORD FORM. IF DECEASED, ASK K-M. OTHERS GO TO Q-15.

14. (continued)

K. When did (CHILD) die? RECORD DAY, MONTH, AND YEAR ON CHILDREN'S RECORD FORM OR SUPPLEMENTARY CHILDREN'S RECORD FORM.

L. What was the cause of death? RECORD BELOW.

M. Where is (CHILD'S) death registered? In what city and state?

(CITY) 42-57/ 58-59/
 (STATE)

15. INTERVIEWER: IS THERE A SECOND PREGNANCY SINCE THE DATE OF LAST INTERVIEW (IS NUMBER OF PREGNANCIES IN 0.128 EQUAL TO 2 OR MORE?)

YES.....(SKIP TO Q.17).....1 60/
 NO.....(SKIP TO Q.25).....2

16. When did that pregnancy end?

RECORD DATE: 61-66/
 NO DA YR

A. How many weeks had (NAME) been pregnant when that happened?

ENTER NUMBER OF WEEKS: 67-68/
 Don't know.....98

IF MISCARRIAGE OR STILLBIRTH, ASK B-C; (OTHERS GO TO D).

B. Did a doctor tell you why this (miscarriage/stillbirth) might have occurred?

Yes.....(ASK C).....1 69/
 No.....(GO TO D).....2

C. What did the doctor say caused the (miscarriage/stillbirth)? RECORD VERBATIM.

70/

18. (Continued)

F. Was (CHILD) a twin?

Yes.....1 15/
 No.....2

F. Was (CHILD) premature, full term, or overdue?

Premature.....1 16/
 Full term.....2
 Overdue.....3
 Don't know.....6

G. How old was (NAME OF MOTHER) when (CHILD) was born?

RECORD AGE: 1 1 1 17-18/
 Don't know.....98

H. What is the name and address of the doctor or medical facility who has (CHILD)'s birth registration records? RECORD BELOW

DOCTOR'S NAME OR FACILITY NAME 19/
 STREET ADDRESS

(CITY) 1 1 1 (STATE)

INTERVIEWER, RECORD NAME AND ADDRESS ON MEDICAL CONSENT FORM

I. What is the name and address of the doctor or medical facility who has (CHILD)'s current medical records? RECORD BELOW

DOCTOR'S NAME OR FACILITY NAME 80/
 STREET ADDRESS

(CITY) 1 1 1 (STATE)

INTERVIEWER, RECORD NAME AND ADDRESS ON MEDICAL CONSENT FORM

J. What is (CHILD)'s current age? RECORD IN CHILDREN'S RECORD FORM OR SUPPLEMENTARY CHILDREN'S RECORD FORM. IF DECEASED, ARE E-H. OTHERS GO TO Q.19.

18. (Continued)

K. When did (CHILD) die? RECORD DAY, MONTH, AND YEAR ON CHILDREN'S RECORD FORM OR SUPPLEMENTARY CHILDREN'S RECORD FORM.

L. What was the cause of death? RECORD BELOW.

10/

M. Where is (CHILD)'S death registered? In what city and state?

1 1 1 1 1 1
 (CITY) 11-26/ (STATE) 27-28/

19. INTERVIEWER, IS THERE A THIRD PREGNANCY SINCE THE DATE OF LAST INTERVIEW? (IF NUMBER OF PREGNANCIES IN Q.12B EQUAL TO 3 OR MORE?)

YES.....(SKIP TO Q.31).....1 29/
 NO.....(SKIP TO Q.25).....2

20. When did that pregnancy end?

RECORD DATE: 1 1 1 1 1 1 10-35/
 MO DA YR

A. How many weeks had (NAME) been pregnant when that happened?

ENTER NUMBER OF WEEKS: 1 1 1 1 1 1 36-37/
 Don't know.....98

IF MISCARRIAGE OR STILLBIRTH, ASK B-C; OTHERS GO TO D.

B. Did a doctor tell why this (miscarriage/stillbirth) might have occurred?

Yes.....(ASK C).....1 38/
 No.....(GO TO D).....2

C. What did the doctor say caused the (miscarriage/stillbirth)? RECORD VERBATIM.

39/

22. (Continued)

F. Was (CHILD) a twin?

Yes.....1 41/
No.....2

I. Was (CHILD) premature, full term, or overdue?

Premature.....1 44/
Full term.....2
Overdue.....3
Don't know.....6

G. How old was (NAME OF MOTHER) when (CHILD) was born?

RECORD AGE: 1 45-46/
Don't know.....96

H. What is the name and address of the doctor or medical facility who has (CHILD)'s birth registration records? RECORD BELOW

DOCTOR'S NAME OR FACILITY NAME 47/
STREET ADDRESS

(CITY) (STATE)

INTERVIEWER: RECORD NAME AND ADDRESS ON MEDICAL CONSENT FORM

I. What is the name and address of the doctor or medical facility who has (CHILD)'s current medical records? RECORD BELOW

DOCTOR'S NAME OR FACILITY NAME 48/
STREET ADDRESS

(CITY) (STATE)

INTERVIEWER: RECORD NAME AND ADDRESS ON MEDICAL CONSENT FORM

J. What is (CHILD)'s current age? RECORD IN CHILDREN'S RECORD FORM OR SUPPLEMENTARY CHILDREN'S RECORD FORM. IF DECEASED, ASK E-H. OTHERS GO TO Q-23.

K. When did (CHILD) die? RECORD DAY, MONTH, AND YEAR ON CHILDREN'S RECORD FORM.

22. (Continued)

L. What was the cause of death? RECORD BELOW. 49/

M. Where is (CHILD'S) death registered? In what city and state?

(CITY) 50-65/ 66-67/
(STATE)

23. INTERVIEWER: IS THERE A FOURTH PREGNANCY SINCE THE DATE OF LAST INTERVIEW? (IS NUMBER OF PREGNANCIES IN Q.12B EQUAL TO 4 OR MORE?)

YES.....(GO TO MEN QUESTIONNAIRE).....1 68/
NO.....(SKIP TO Q.25).....2

24. When did that pregnancy end?

RECORD DATE: 1 69-74/
MO DA YR

A. How many weeks had (NAME) been pregnant when that happened?

ENTER NUMBER OF WEEKS: 1 75-76/
Don't know.....96

IF MISCARRIAGE, ASK B-C; OTHERS GO TO D.

B. Did a doctor tell why this miscarriage might have occurred?

Yes.....(ASK C).....1 77/
No.....(GO TO D).....2

C. What did the doctor say caused the miscarriage?
RECORD VERBATIM. 78/

D. INTERVIEWER: IS THERE A FOURTH PREGNANCY SINCE DATE OF LAST INTERVIEW? (IS NUMBER OF PREGNANCIES IN Q.12B EQUAL TO 4 OR MORE?)

YES.....(GO TO MEN QUESTIONNAIRE).....1 79/
NO.....2

25. Since (DATE OF LAST INTERVIEW) have you ever tried for a period of one year or more, to conceive a child and were not able to do so?

Yes.....1 10/
No.....2

NO.....(SKIP TO SECTION 6).....2

26. For how many periods of one year or more did this happen?

One.....1 11/
Two.....2
Three.....3

27. Since (DATE OF LAST INTERVIEW), in what month and year did the first period begin? And in what month and year did it end?

Begin 12-15/ End 16-19/
MO YR MO YR
OR HAS NOT
ENDED.....0000

28. During (PERIOD) what was your wife or partner's first name?

RECORD BELOW.
20-33/
34-35/
ID #

29. How old was (NAME) in (BEGINNING DATE OF PERIOD)?

RECORD AGE: 36-37/

30. During (PERIOD), did either of you see a doctor to discuss any difficulties in conceiving children?

Yes.....1 36/
No.....2

31. CODE "PERIOD 1" AND NAME SELF-ADMINISTERED FORM 1.

There are many reasons that some couples find it difficult or impossible to conceive a child. Please read this card and circle the number on Side A for each reason which applied to you for this period. Side B provides reasons appropriate for your spouse. Circle as many responses as appropriate.

Now please fill out this card and place it in the envelope when you are finished.

32. INTERVIEWER: IS THERE A SECOND PERIOD OF INFERTILITY SINCE DATE OF LAST INTERVIEW? (IS Q.26 CODED "TWO" OR MORE?)

Yes.....1 39/
No.....2

NO.....(SKIP TO SECTION 6).....2

33. Since (DATE OF LAST INTERVIEW), in what month and year did the second period begin? And in what month and year did it end?

Begin 40-43/ End 44-47/
MO YR MO YR

34. During this second period what was your wife or partner's first name? RECORD BELOW.

48-61/
62-63/
ID #

35. How old was (NAME) in (BEGINNING DATE OF PERIOD)?

RECORD AGE: 64-65/

36. During this second period did either of you see a doctor to discuss any difficulties in conceiving children?

Yes.....1 66/
No.....2

37. CODE "PERIOD 2" AND NAME SELF-ADMINISTERED FORM 1.

There are many reasons that some couples find it difficult or impossible to conceive a child. Please read this card and circle the number on Side A for each reason which applied to you for this period. Side B provides reasons appropriate for your spouse. Circle as many responses as appropriate.

Now please fill out this card and place it in the envelope when you are finished.

38. INTERVIEWER: IS THERE A THIRD PERIOD OF INFERTILITY SINCE DATE OF LAST INTERVIEW? (IS Q.26 CODED "THREE"?)

Yes.....1 67/
No.....2

39. Since (DATE OF LAST INTERVIEW), in what month and year did the next period begin? And in what month and year did it end?

| | | | |
|----------------------------|--------|-----|--------|
| Begin | 60-71/ | End | 72-75/ |
| MO | YR | MO | YR |
| OR HAS NOT EMUDED.....0000 | | | |

40. During (PERIOD) what was your wife or partner's first name? RECORD BELOW.

| | | | | | | | | | |
|---------------|--------|---|---|---|---|---|---|---|----|
| BEGIN DATE 16 | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 10-23/ | 24-25/ | | | | | | | | |

41. How old was (NAME) in (BEGINNING DATE OF PERIOD)?

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| RECORD AGE: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
|-------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|

42. During (PERIOD), did either of you see a doctor to discuss any difficulties in conceiving children?

| | |
|-----------|-----|
| Yes.....1 | 28/ |
| No.....2 | |

43. CODE "PERIOD 3" AND HAND SELF-ADMINISTERED FORM 1.

There are many reasons that some couples find it difficult or impossible to conceive a child. Please read this card and circle the number on Side A for each reason which applied to you for this period. Side B provides reasons appropriate for your spouse. Circle as many responses as appropriate.

Now please fill out this card and place it in the envelope when you are finished.

Section 6: Child and Family Health

Now I would like to ask you some questions about birth defects in your family. By birth defects I mean a physical abnormality present (though not necessarily noticed) at the time of birth. Birth defects range in severity from unusual birthmarks to a missing or misshapen limb. Birth defects can affect any part of the body, including bones, body organs such as kidneys or the heart, reproductive and respiratory systems, blood, and the skin.

1. INTERVIEWER: HAS RESPONDENT HAD ANY BIOLOGICAL CHILDREN?

| | |
|-----------------------------|-----|
| YES.....(ASK A).....1 | 29/ |
| NO.....(SKIP TO Q.22).....2 | |

First, I would like to verify whether (any of) your biological child(ren) have (had) a birth defect.

A. ARE CHILDREN RECORDED ON CHILDREN'S RECORD FORM?

| | |
|----------------------------|-----|
| YES.....(ASK B).....1 | 30/ |
| NO.....(SKIP TO Q.2).....2 | |

B. FOR EACH CHILD LISTED ON CHILDREN'S RECORD FORM ASK: (On records indicate that (CHILD)(had/did not have) a birth defect in 1982, when you were last interviewed. Is this information correct?)

| | |
|--|-----|
| IF INFORMATION IS CORRECT..(GO TO Q.2).....1 | 31/ |
| IF INFORMATION IS INCORRECT, MAKE CORRECTIONS ON CHILDREN'S RECORD FORM.....(Then go to Q.2).....2 | |
| Don't know.....(GO TO Q.2).....3 | |

2. FOR EACH CHILD (EXCEPT CHILDREN WHO DIED BEFORE 1982) ASK: Has a(n additional) defect been identified in (CHILD)(since 1982)? RECORD ON CHILDREN'S RECORD FORM ON SUPPLEMENTARY CHILDREN'S RECORD FORM.

3. INTERVIEWER: ASK QUESTIONS 4-20 FOR EACH CHILD, INCLUDING ALL WHO MAY HAVE DIED.

(Now I would like to ask about (NEXT CHILD)).

| | 1ST CHILD | 2ND CHILD |
|--|--|--|
| CHILD'S NAME, CHILD'S IUP MOTHER'S IUP | 52-53/ 54-55/ | 49-50/ 51-52/ |
| 4. Did (CHILD) ever have a diagnosis... (READ EACH CATEGORY)... | Yes No learning disability.....1 2 34/ physical or motor impairment.....1 2 31/ mental impairment.....1 2 38/ | Yes No1 2 35/1 2 34/1 2 35/ |
| 5. Was (CHILD) ever diagnosed as having cancer? | Yes.....(ASK A & B).....1 39/ No.....(GO TO Q.6).....2 | Yes.....1 36/ No.....(GO, 6).....2 |
| A. In what month and year was the diagnosis made? | NO YES 40-43/ | NO YES 51-60/ |
| B. What kind of cancer was diagnosed? | Don't know.....B | Don't know.....B |
| 6. INTERVIEWER, HAS ANY DEFECT OR IMPAIRMENT BEEN IDENTIFIED IN (CHILD)? CHECK CHILDREN'S RECORD FORM AND Qs. 1, 2, AND 4. | YES.....(GO TO Q.7).....1 45/ NO.....(ASK A).....2 | YES.....(GO, 7).....1 47/ NO.....(A).....2 |
| A. INTERVIEWER, IS THERE ANOTHER CHILD? | YES.....(ASK Q.4 AND 5).....1 46/ NO.....(SKIP TO Q.22).....2 | YES.....(GO, 4 AND 5).....1 45/ NO.....(GO, 22).....2 |
| 7. What kind of (birth defect(s)/ impairment) does/did (CHILD) have? Any others? | 41/ | 44/ |
| 8. Did you (or someone else) discuss (CHILD'S) (birth defect(s)/impairment) with a doctor? | Yes.....(GO TO Q.9).....1 48/ No.....(SKIP TO Q.11).....2 | Yes.....(GO, 9).....1 45/ No.....(GO, 11).....2 |

PLEASE GO ON TO NEXT PAGE ----->

| 1ST CHILD | 2ND CHILD | 3RD CHILD | 4TH CHILD | 5TH CHILD | 6TH CHILD |
|-----------|-----------|-----------|-----------|-----------|-----------|
| 00-07/ | 00-07/ | 10-17/ | 31-37/ | 48-49/ | |
| 00-07/ | 00-07/ | 10-17/ | 31-37/ | 48-49/ | 50-51/ |
| Yes No | Yes No | Yes No | Yes No | Yes No | Yes No |
| 1 2 10/ | 1 2 10/ | 1 2 10/ | 1 2 10/ | 1 2 10/ | 1 2 10/ |
| 1 2 11/ | 1 2 11/ | 1 2 11/ | 1 2 11/ | 1 2 11/ | 1 2 11/ |
| 1 2 12/ | 1 2 12/ | 1 2 12/ | 1 2 12/ | 1 2 12/ | 1 2 12/ |
| 1 2 13/ | 1 2 13/ | 1 2 13/ | 1 2 13/ | 1 2 13/ | 1 2 13/ |
| 1 2 14/ | 1 2 14/ | 1 2 14/ | 1 2 14/ | 1 2 14/ | 1 2 14/ |
| 1 2 15/ | 1 2 15/ | 1 2 15/ | 1 2 15/ | 1 2 15/ | 1 2 15/ |
| 1 2 16/ | 1 2 16/ | 1 2 16/ | 1 2 16/ | 1 2 16/ | 1 2 16/ |
| 1 2 17/ | 1 2 17/ | 1 2 17/ | 1 2 17/ | 1 2 17/ | 1 2 17/ |
| 1 2 18/ | 1 2 18/ | 1 2 18/ | 1 2 18/ | 1 2 18/ | 1 2 18/ |
| 1 2 19/ | 1 2 19/ | 1 2 19/ | 1 2 19/ | 1 2 19/ | 1 2 19/ |
| 1 2 20/ | 1 2 20/ | 1 2 20/ | 1 2 20/ | 1 2 20/ | 1 2 20/ |
| 1 2 21/ | 1 2 21/ | 1 2 21/ | 1 2 21/ | 1 2 21/ | 1 2 21/ |
| 1 2 22/ | 1 2 22/ | 1 2 22/ | 1 2 22/ | 1 2 22/ | 1 2 22/ |
| 1 2 23/ | 1 2 23/ | 1 2 23/ | 1 2 23/ | 1 2 23/ | 1 2 23/ |
| 1 2 24/ | 1 2 24/ | 1 2 24/ | 1 2 24/ | 1 2 24/ | 1 2 24/ |
| 1 2 25/ | 1 2 25/ | 1 2 25/ | 1 2 25/ | 1 2 25/ | 1 2 25/ |
| 1 2 26/ | 1 2 26/ | 1 2 26/ | 1 2 26/ | 1 2 26/ | 1 2 26/ |
| 1 2 27/ | 1 2 27/ | 1 2 27/ | 1 2 27/ | 1 2 27/ | 1 2 27/ |
| 1 2 28/ | 1 2 28/ | 1 2 28/ | 1 2 28/ | 1 2 28/ | 1 2 28/ |
| 1 2 29/ | 1 2 29/ | 1 2 29/ | 1 2 29/ | 1 2 29/ | 1 2 29/ |
| 1 2 30/ | 1 2 30/ | 1 2 30/ | 1 2 30/ | 1 2 30/ | 1 2 30/ |
| 1 2 31/ | 1 2 31/ | 1 2 31/ | 1 2 31/ | 1 2 31/ | 1 2 31/ |
| 1 2 32/ | 1 2 32/ | 1 2 32/ | 1 2 32/ | 1 2 32/ | 1 2 32/ |
| 1 2 33/ | 1 2 33/ | 1 2 33/ | 1 2 33/ | 1 2 33/ | 1 2 33/ |
| 1 2 34/ | 1 2 34/ | 1 2 34/ | 1 2 34/ | 1 2 34/ | 1 2 34/ |
| 1 2 35/ | 1 2 35/ | 1 2 35/ | 1 2 35/ | 1 2 35/ | 1 2 35/ |
| 1 2 36/ | 1 2 36/ | 1 2 36/ | 1 2 36/ | 1 2 36/ | 1 2 36/ |
| 1 2 37/ | 1 2 37/ | 1 2 37/ | 1 2 37/ | 1 2 37/ | 1 2 37/ |
| 1 2 38/ | 1 2 38/ | 1 2 38/ | 1 2 38/ | 1 2 38/ | 1 2 38/ |
| 1 2 39/ | 1 2 39/ | 1 2 39/ | 1 2 39/ | 1 2 39/ | 1 2 39/ |
| 1 2 40/ | 1 2 40/ | 1 2 40/ | 1 2 40/ | 1 2 40/ | 1 2 40/ |
| 1 2 41/ | 1 2 41/ | 1 2 41/ | 1 2 41/ | 1 2 41/ | 1 2 41/ |
| 1 2 42/ | 1 2 42/ | 1 2 42/ | 1 2 42/ | 1 2 42/ | 1 2 42/ |
| 1 2 43/ | 1 2 43/ | 1 2 43/ | 1 2 43/ | 1 2 43/ | 1 2 43/ |
| 1 2 44/ | 1 2 44/ | 1 2 44/ | 1 2 44/ | 1 2 44/ | 1 2 44/ |
| 1 2 45/ | 1 2 45/ | 1 2 45/ | 1 2 45/ | 1 2 45/ | 1 2 45/ |
| 1 2 46/ | 1 2 46/ | 1 2 46/ | 1 2 46/ | 1 2 46/ | 1 2 46/ |
| 1 2 47/ | 1 2 47/ | 1 2 47/ | 1 2 47/ | 1 2 47/ | 1 2 47/ |
| 1 2 48/ | 1 2 48/ | 1 2 48/ | 1 2 48/ | 1 2 48/ | 1 2 48/ |
| 1 2 49/ | 1 2 49/ | 1 2 49/ | 1 2 49/ | 1 2 49/ | 1 2 49/ |
| 1 2 50/ | 1 2 50/ | 1 2 50/ | 1 2 50/ | 1 2 50/ | 1 2 50/ |
| 1 2 51/ | 1 2 51/ | 1 2 51/ | 1 2 51/ | 1 2 51/ | 1 2 51/ |
| 1 2 52/ | 1 2 52/ | 1 2 52/ | 1 2 52/ | 1 2 52/ | 1 2 52/ |
| 1 2 53/ | 1 2 53/ | 1 2 53/ | 1 2 53/ | 1 2 53/ | 1 2 53/ |
| 1 2 54/ | 1 2 54/ | 1 2 54/ | 1 2 54/ | 1 2 54/ | 1 2 54/ |
| 1 2 55/ | 1 2 55/ | 1 2 55/ | 1 2 55/ | 1 2 55/ | 1 2 55/ |
| 1 2 56/ | 1 2 56/ | 1 2 56/ | 1 2 56/ | 1 2 56/ | 1 2 56/ |
| 1 2 57/ | 1 2 57/ | 1 2 57/ | 1 2 57/ | 1 2 57/ | 1 2 57/ |
| 1 2 58/ | 1 2 58/ | 1 2 58/ | 1 2 58/ | 1 2 58/ | 1 2 58/ |
| 1 2 59/ | 1 2 59/ | 1 2 59/ | 1 2 59/ | 1 2 59/ | 1 2 59/ |
| 1 2 60/ | 1 2 60/ | 1 2 60/ | 1 2 60/ | 1 2 60/ | 1 2 60/ |
| 1 2 61/ | 1 2 61/ | 1 2 61/ | 1 2 61/ | 1 2 61/ | 1 2 61/ |
| 1 2 62/ | 1 2 62/ | 1 2 62/ | 1 2 62/ | 1 2 62/ | 1 2 62/ |
| 1 2 63/ | 1 2 63/ | 1 2 63/ | 1 2 63/ | 1 2 63/ | 1 2 63/ |
| 1 2 64/ | 1 2 64/ | 1 2 64/ | 1 2 64/ | 1 2 64/ | 1 2 64/ |
| 1 2 65/ | 1 2 65/ | 1 2 65/ | 1 2 65/ | 1 2 65/ | 1 2 65/ |
| 1 2 66/ | 1 2 66/ | 1 2 66/ | 1 2 66/ | 1 2 66/ | 1 2 66/ |
| 1 2 67/ | 1 2 67/ | 1 2 67/ | 1 2 67/ | 1 2 67/ | 1 2 67/ |
| 1 2 68/ | 1 2 68/ | 1 2 68/ | 1 2 68/ | 1 2 68/ | 1 2 68/ |
| 1 2 69/ | 1 2 69/ | 1 2 69/ | 1 2 69/ | 1 2 69/ | 1 2 69/ |
| 1 2 70/ | 1 2 70/ | 1 2 70/ | 1 2 70/ | 1 2 70/ | 1 2 70/ |
| 1 2 71/ | 1 2 71/ | 1 2 71/ | 1 2 71/ | 1 2 71/ | 1 2 71/ |
| 1 2 72/ | 1 2 72/ | 1 2 72/ | 1 2 72/ | 1 2 72/ | 1 2 72/ |
| 1 2 73/ | 1 2 73/ | 1 2 73/ | 1 2 73/ | 1 2 73/ | 1 2 73/ |
| 1 2 74/ | 1 2 74/ | 1 2 74/ | 1 2 74/ | 1 2 74/ | 1 2 74/ |
| 1 2 75/ | 1 2 75/ | 1 2 75/ | 1 2 75/ | 1 2 75/ | 1 2 75/ |
| 1 2 76/ | 1 2 76/ | 1 2 76/ | 1 2 76/ | 1 2 76/ | 1 2 76/ |
| 1 2 77/ | 1 2 77/ | 1 2 77/ | 1 2 77/ | 1 2 77/ | 1 2 77/ |
| 1 2 78/ | 1 2 78/ | 1 2 78/ | 1 2 78/ | 1 2 78/ | 1 2 78/ |
| 1 2 79/ | 1 2 79/ | 1 2 79/ | 1 2 79/ | 1 2 79/ | 1 2 79/ |
| 1 2 80/ | 1 2 80/ | 1 2 80/ | 1 2 80/ | 1 2 80/ | 1 2 80/ |
| 1 2 81/ | 1 2 81/ | 1 2 81/ | 1 2 81/ | 1 2 81/ | 1 2 81/ |
| 1 2 82/ | 1 2 82/ | 1 2 82/ | 1 2 82/ | 1 2 82/ | 1 2 82/ |
| 1 2 83/ | 1 2 83/ | 1 2 83/ | 1 2 83/ | 1 2 83/ | 1 2 83/ |
| 1 2 84/ | 1 2 84/ | 1 2 84/ | 1 2 84/ | 1 2 84/ | 1 2 84/ |
| 1 2 85/ | 1 2 85/ | 1 2 85/ | 1 2 85/ | 1 2 85/ | 1 2 85/ |
| 1 2 86/ | 1 2 86/ | 1 2 86/ | 1 2 86/ | 1 2 86/ | 1 2 86/ |
| 1 2 87/ | 1 2 87/ | 1 2 87/ | 1 2 87/ | 1 2 87/ | 1 2 87/ |
| 1 2 88/ | 1 2 88/ | 1 2 88/ | 1 2 88/ | 1 2 88/ | 1 2 88/ |
| 1 2 89/ | 1 2 89/ | 1 2 89/ | 1 2 89/ | 1 2 89/ | 1 2 89/ |
| 1 2 90/ | 1 2 90/ | 1 2 90/ | 1 2 90/ | 1 2 90/ | 1 2 90/ |
| 1 2 91/ | 1 2 91/ | 1 2 91/ | 1 2 91/ | 1 2 91/ | 1 2 91/ |
| 1 2 92/ | 1 2 92/ | 1 2 92/ | 1 2 92/ | 1 2 92/ | 1 2 92/ |
| 1 2 93/ | 1 2 93/ | 1 2 93/ | 1 2 93/ | 1 2 93/ | 1 2 93/ |
| 1 2 94/ | 1 2 94/ | 1 2 94/ | 1 2 94/ | 1 2 94/ | 1 2 94/ |
| 1 2 95/ | 1 2 95/ | 1 2 95/ | 1 2 95/ | 1 2 95/ | 1 2 95/ |
| 1 2 96/ | 1 2 96/ | 1 2 96/ | 1 2 96/ | 1 2 96/ | 1 2 96/ |
| 1 2 97/ | 1 2 97/ | 1 2 97/ | 1 2 97/ | 1 2 97/ | 1 2 97/ |
| 1 2 98/ | 1 2 98/ | 1 2 98/ | 1 2 98/ | 1 2 98/ | 1 2 98/ |
| 1 2 99/ | 1 2 99/ | 1 2 99/ | 1 2 99/ | 1 2 99/ | 1 2 99/ |
| 1 2 100/ | 1 2 100/ | 1 2 100/ | 1 2 100/ | 1 2 100/ | 1 2 100/ |

| 1ST CHILD | 2ND CHILD |
|--|--|
| CHILD'S NAME: CHILD'S ID # MOTHER'S ID # | CHILD'S NAME: CHILD'S ID # MOTHER'S ID # |
| 9. INTERVIEWER: IF DEFICIENT, DISABILITY, OR IMPAIRMENT FOUND SINCE 1962 ASK Q.9; OTHERS GO TO Q.10. What is the name and address of the doctor who diagnosed CHILD as having a birth defect/impairment? | 9. INTERVIEWER: IF DEFICIENT, DISABILITY, OR IMPAIRMENT FOUND SINCE 1962 ASK Q.9; OTHERS GO TO Q.10. What is the name and address of the doctor who diagnosed CHILD as having a birth defect/impairment? |
| DOCTOR'S NAME OR FACILITY NAME STREET ADDRESS CITY STATE | DOCTOR'S NAME OR FACILITY NAME STREET ADDRESS CITY STATE |
| 10. Did the doctor say that (CHILD) needs/ed any testing, medication, treatment, surgery, or special equipment because of a (birth defect/impairment)? (by special equipment I mean a wheelchair, walker, artificial limb, body braces), or crutches). | 10. Did the doctor say that (CHILD) needs/ed any testing, medication, treatment, surgery, or special equipment because of a (birth defect/impairment)? (by special equipment I mean a wheelchair, walker, artificial limb, body braces), or crutches). |
| Yes.....1 60/ No.....2 Don't know.....8 | Yes.....1 60/ No.....2 Don't know.....8 |
| 11. Did (CHILD) ever receive any testing, medication, treatment, surgery or special equipment because of a (birth defect/ impairment)? | 11. Did (CHILD) ever receive any testing, medication, treatment, surgery or special equipment because of a (birth defect/ impairment)? |
| Yes.....1 61/ No.....2 Don't know.....8 | Yes.....1 61/ No.....2 Don't know.....8 |
| 12. At any time, did (CHILD'S) (birth defect/impairment) interfere in any way with (CHILD'S) physical or social development? For example, getting a job or making friends? | 12. At any time, did (CHILD'S) (birth defect/impairment) interfere in any way with (CHILD'S) physical or social development? For example, getting a job or making friends? |
| Yes.....(GO TO Q.13).....1 62/ No.....(ASK A).....2 Don't know.....8 | Yes.....(GO TO Q.13).....1 62/ No.....(ASK A).....2 Don't know.....8 |
| A. INTERVIEWER: WAS THERE A YES CODED AT Q.10 or Q.11? | A. INTERVIEWER: WAS THERE A YES CODED AT Q.10 or Q.11? |
| YES.....(GO TO Q.13).....1 63/ NO.....(ASK B).....2 | YES.....(GO TO Q.13).....1 63/ NO.....(ASK B).....2 |
| B. INTERVIEWER: IS THERE ANOTHER CHILD? | B. INTERVIEWER: IS THERE ANOTHER CHILD? |
| YES.....(GO BACK TO Q.9 FOR NEXT CHILD).....1 70/ NO.....(SKIP TO Q.22).....2 | YES.....(GO BACK TO Q.9 FOR NEXT CHILD).....1 70/ NO.....(SKIP TO Q.22).....2 |

[illegible]

| CHILD'S NAME: | 1ST CHILD | 2ND CHILD |
|---|---|---|
| CHILD'S ID / MOMENTS ID 7 | | |
| 13. Did (CHILD'S) doctor say that baby still (CHILD'S) (birth defects)/impairments was/were life-threatening if left untreated (by untreated) mean if (CHILD) did not receive surgery, medication, a special diet, or some other medical intervention.) | Yes.....(ASK A).....1 No.....(ASK A).....2 Don't know.....(ASK A).....3 | Yes.....(ASK A).....1 No.....(ASK A).....2 Don't know.....(ASK A).....3 |
| A. INTERVIEWER: IS CHILD UNDER TWO YEARS OLD OR DID CHILD DIE BEFORE HE/SHE WAS TWO YEARS OLD? | Yes.....(SKIP TO Q.20).....1 No.....2 | Yes.....(SKIP TO Q.20).....1 No.....2 |
| 14. Did (CHILD) ever need help with eating, dressing, bathing, or using the toilet because of a (birth defect)/impairment? (help includes someone actually helping rather than just standing by to assist if needed.) | Yes.....1 No.....2 | Yes.....1 No.....2 |
| 15. Because of a (birth defect)/impairment, did (CHILD) ever use or need any mechanical or special aids such as a wheelchair, walker, baby braces, artificial limbs, or crutches to carry out everyday activities? | Yes.....1 No.....2 | Yes.....1 No.....2 |
| 16. Was (CHILD) ever unable to take part at all in ordinary play with other children because of a (birth defect)/impairment? | Yes.....(GO TO Q.17).....1 No.....(ASK A).....2 | Yes.....(GO TO Q.17).....1 No.....(ASK A).....2 |
| A. Was (CHILD) ever limited in the kind or amount of play he/she could do because of his/her (birth defect)/impairment? | Yes.....1 No.....2 | Yes.....1 No.....2 |

| 3RD CHILD | 4TH CHILD | 5TH CHILD | 6TH CHILD |
|--------------------|--------------------|--------------------|--------------------|
| 63/ | 45/ | 55/ | 61/ |
|(ASK A).....1 |(ASK A).....1 |(ASK A).....1 |(ASK A).....1 |
|(ASK A).....2 |(ASK A).....2 |(ASK A).....2 |(ASK A).....2 |
|(ASK A).....3 |(ASK A).....3 |(ASK A).....3 |(ASK A).....3 |
|(0,20).....1 |(0,20).....1 |(0,20).....1 |(0,20).....1 |
|2 |2 |2 |2 |
| 64/ | 56/ | 56/ | 62/ |
|(0,20).....1 |(0,20).....1 |(0,20).....1 |(0,20).....1 |
|2 |2 |2 |2 |
| 65/ | 51/ | 51/ | 63/ |
|1 |1 |1 |1 |
|2 |2 |2 |2 |
| 66/ | 52/ | 56/ | 64/ |
|1 |1 |1 |1 |
|2 |2 |2 |2 |
| 67/ | 53/ | 59/ | 65/ |
|(0,17).....1 |(0,17).....1 |(0,17).....1 |(0,17).....1 |
|(ASK A).....2 |(ASK A).....2 |(ASK A).....2 |(ASK A).....2 |
|1 |1 |1 |1 |
|2 |2 |2 |2 |

| CHILD'S NAME: CHILD'S ID # BIRTH DATE TO 7 | 1ST CHILD | 2ND CHILD |
|---|--------------------------------|--------------------------|
| 17. Did (CHILD'S) (birth defect(s)/ impairment) ever keep (him/ her) from going to school? | Yes.....(60 TO 0,10).....1 67/ | Yes.....(0,10).....1 12/ |
| | No.....(ASK A).....2 | No.....(ASK A).....2 |
| A. Did (CHILD) ever have to go to a certain type of school, or be in a special class because of (his/her) (birth defect(s)/impairment)? | Yes.....(60 TO 0,10).....1 66/ | Yes.....(0,10).....1 16/ |
| | No.....(ASK B).....2 | No.....(ASK B).....2 |
| B. Was (CHILD) ever limited in school attendance or in being able to learn because of (his/her) (birth defect(s)/impairment)? | Yes.....1 89/ | Yes.....1 11/ |
| | No.....2 | No.....2 |
| 18. Because of (his/her) (birth defect(s)/impairment) did (CHILD) ever need a lot more help than other children (CHILD'S) age in going outside, getting to school, going to the store, and other everyday activities (the last)? | Yes.....1 10/ | Yes.....1 16/ |
| | No.....2 | No.....2 |
| 19. Because of a (birth defect/ impairment), did (CHILD) ever need the help of another person for every- day activities such as taking care of the house or yard, doing the laundry, or preparing meals? | Yes.....1 11/ | Yes.....1 16/ |
| | No.....2 | No.....2 |
| | BEGIN DUCK 3) | |
| 20. Will/Need (CHILD'S) (birth defect(s) (keep/have kept) (him/her) from making on a job for pay? | Yes.....(60 TO 0,21).....1 12/ | Yes.....(0,21).....1 10/ |
| | No.....(ASK A).....2 | No.....(ASK A).....2 |
| A. Will/Need (CHILD) (be/have been) limited in the kind of work (he/she) could (do/have done) because of (his/her) (birth defect(s))? | Yes.....(60 TO 0,21).....1 15/ | Yes.....(0,21).....1 11/ |
| | No.....(ASK B).....2 | No.....(ASK B).....2 |
| B. Will/Need (CHILD) (be/have been) limited in the amount of work (he/she) could (do/have done) because of (his/her) (birth defect(s))? | Yes.....1 16/ | Yes.....1 12/ |
| | No.....2 | No.....2 |

| 2ND CHILD | 4TH CHILD | 5TH CHILD | 6TH CHILD |
|--------------------|--------------------|--------------------|--------------------|
|1 13/ |1 21/ |1 20/ |1 51/ |
|(ASK A).....2 |(ASK A).....2 |(ASK A).....2 |(ASK A).....2 |
|1 14/ |1 22/ |1 30/ |1 50/ |
|(ASK B).....2 |(ASK B).....2 |(ASK B).....2 |(ASK B).....2 |
|1 15/ |1 23/ |1 31/ |1 50/ |
|2 |2 |2 |2 |
|1 16/ |1 24/ |1 32/ |1 40/ |
|2 |2 |2 |2 |
|1 17/ |1 25/ |1 33/ |1 41/ |
|2 |2 |2 |2 |
|1 18/ |1 26/ |1 34/ |1 42/ |
|(ASK A).....2 |(ASK A).....2 |(ASK A).....2 |(ASK A).....2 |
|1 19/ |1 27/ |1 35/ |1 43/ |
|(ASK B).....2 |(ASK B).....2 |(ASK B).....2 |(ASK B).....2 |
|1 20/ |1 28/ |1 36/ |1 44/ |
|2 |2 |2 |2 |

CHILD'S NAME:

CHILD'S ID #

CHILD'S ID #

21. INTERVIEWER: DOES HE SPEAK ENGLISH?

YES.....(GO BACK TO Q.31).....1 43/

NO.....(GO TO Q.22).....2

22. Did you ever have a birth defect?

Yes.....(ASK A).....1 47/

No.....2

A. What kind of birth defect was it? Any others?

48/

23. Do you have any biological brothers or sisters? Include any brothers or sisters who may have died before the age of 1.

Yes.....(ASK Q.24).....1 49/

No.....(SKIP TO Q.25).....2

Don't know.....(SKIP TO Q.25).....0

| 3RD CHILD | 4TH CHILD | 5TH CHILD | 6TH CHILD |
|----------------------|----------------------|----------------------|----------------------|
|(0,3).....1 54/ |(0,3).....1 51/ |(0,3).....1 52/ |(0,3).....1 53/ |
|(0,22).....2 |(0,22).....2 |(0,22).....2 |(0,22).....2 |

24. Ind any of your biological brothers or sisters ever have a birth defect?

Yes.....(ASK A).....1 54/
 No.....(SKIP TO Q.25).....2
 Don't know.....(SKIP TO Q.25).....0

A. Who had a defect, brothers, sisters, or both?

Brothers.....1 55/
 Sisters.....2
 Both.....3

FOR EACH SIBLING WITH A BIRTH DEFECT, ASK: What kind of birth defect did your (brother/sister) have? Was this sibling a half (brother/sister) or a full (brother/sister)? RECORD BELOW.

Sibling 1 Sibling 2
 DEFECT: 56/ DEFECT: 56/

Half (brother/sister)...1 57/ Half (brother/sister)...1 59/
 Full (brother/sister)...2 Full (brother/sister)...2

Sibling 3 Sibling 4
 DEFECT: 60/ DEFECT: 62/

Half (brother/sister)...1 61/ Half (brother/sister)...1 63/
 Full (brother/sister)...2 Full (brother/sister)...2

25. Now I would like to ask you some questions about your biological parents. Did either your biological mother or biological father ever have a birth defect?

Yes.....(GO TO Q.26).....1 64/
 No.....(SKIP TO Q.28).....2
 Don't know.....(SKIP TO Q.28).....0

26. Which parent had a birth defect?

Mother only.....1 65/
 Father only.....2
 Both parents.....3

SECTION 7: HEALTH

27. What kind of birth defect did your (PARENT) have?

Mothers: 60/ Fathers: 61/

Now I have some different kind of questions.

28. Has anyone near to you died in the last 12 months?

Yes...(ASK A AND B).....1 60/
No.....2

HAND CARD 1

A. What was the person's relationship to you? Please choose as many as apply. CODE ALL THAT APPLY.

- A. Child.....01 69-70/
- B. Parent.....02 71-72/
- C. Spouse/partner.....03 73-74/
- D. Brother or sister.....04 75-76/
- E. Other near relative of you or your spouse/partner.....05 77-78/
- F. Friend.....06 79-80/
- G. Other (SPECIFY) BEGIN DECK 38

07 10-11/

B. What (was the date/were the dates) of the death(s)? What month and year?

ENTER MONTH AND YEAR: 12-15/ MO YR
ENTER MONTH AND YEAR: 16-19/ MO YR
ENTER MONTH AND YEAR: 20-23/ MO YR

1. Now let's talk about health. Compared to other people your age, would you say that your health is . . . (READ CHOICES)?

Excellent.....1 24/
Good.....2
Fair.....3
Poor.....4

2. Since (DATE OF LAST INTERVIEW) have you had acne on your face, chest or back?

Yes.....1 25/
No.....(SKIP TO Q.8).....2

3. During what year, between (DATE OF LAST INTERVIEW) and now, did you last have acne on your face, chest or back?

RECORD YEAR: 1 1 1 26-27/

4. Think about the (first/next) time you had acne on your face, chest or back between (DATE OF LAST INTERVIEW) and now. When did it start and until when did it last? (PROBE FOR ALL PERIODS OF TIME).

| First | Second | Third |
|--------|--------|--------|
| Mo Yr | Mo Yr | Mo Yr |
| 28-31/ | 36-39/ | 44-47/ |
| to | to | to |
| Mo Yr | Mo Yr | Mo Yr |
| 32-35/ | 40-43/ | 48-51/ |

0. 4. INTERVIEWER, ASK A FOUR PART TIME IN 0.4

A. Please show me in this diagram where the acne (to/has) located (the [front/back] time). (CIRCLE "YES" OR "NO")

| | FIRST TIME | | SECOND TIME | | THIRD TIME | |
|-----------------|------------|---------|-------------|---------|------------|-----|
| | Yes | No | Yes | No | Yes | No |
| Temples | 1 2 52/ | 1 2 61/ | 1 2 61/ | 1 2 61/ | 1 2 61/ | 10/ |
| Eyes or eyelids | 1 2 53/ | 1 2 62/ | 1 2 62/ | 1 2 62/ | 1 2 62/ | 71/ |
| Ears | 1 2 54/ | 1 2 63/ | 1 2 63/ | 1 2 63/ | 1 2 63/ | 72/ |
| Cheeks | 1 2 55/ | 1 2 64/ | 1 2 64/ | 1 2 64/ | 1 2 64/ | 73/ |
| Nose | 1 2 56/ | 1 2 65/ | 1 2 65/ | 1 2 65/ | 1 2 65/ | 74/ |
| Forehead | 1 2 57/ | 1 2 66/ | 1 2 66/ | 1 2 66/ | 1 2 66/ | 75/ |
| Jaw, Chin Other | 1 2 58/ | 1 2 67/ | 1 2 67/ | 1 2 67/ | 1 2 67/ | 76/ |
| Chest | 1 2 59/ | 1 2 68/ | 1 2 68/ | 1 2 68/ | 1 2 68/ | 77/ |
| Back | 1 2 60/ | 1 2 69/ | 1 2 69/ | 1 2 69/ | 1 2 69/ | 78/ |

IF ANY "YES" TO TEMPLES, EYES, EYELIDS OR EARS IN A ABOVE, ASK 0.5
ALL OTHERS SKIP TO 0.6

5. Between (DATE OF LAST INTERVIEW) and now, did you ever consult a doctor or medical facility about the acne on your [temples/eyes/eyelids/ears]?

Yes.....1 79/
No (SKIP TO 0.8).....2

6. What month and year did you last consult a doctor about the acne on your [temples/eyes/eyelids/ears]?

BEGIN DATE 39

10-11/ 10-11/

Mo Tr

7. What was the name of the doctor or medical facility you consulted at the time?

Last Name

First Name

OR

Facility Name

A. What is the address of that (doctor/medical facility)?

14/

STREET ADDRESS

CITY

(STATE)

8. What is your blood type?

15/

NAME
CARD
E

A.....1

B.....2

O.....3

AB.....4

Don't know.....6

A. Is that positive or negative?

16/

Positive.....1

Negative.....2

9. During the last year, how often, on average, would you say you use aspirin?

17/

More than 4 aspirin a day.....1

4 aspirin a day (2 doses a day).....2

2 aspirin a day (1 dose a day).....3

6-8 aspirin a week (1 dose, 3-4 days/week).....4

4 aspirin a week or less.....5

None.....6

NAME
CARD
L

ANSWERS ALL QUESTIONS

10- 19

10. The next questions deal with your reaction to the sun without the use of suntan lotion. If your skin was exposed to the sunlight for the first time in the summer for a period of 30 minutes would you

- Always burn, never tan.....1 19/
 Usually burn, tan with difficulty.....2
 Sometimes burn mildly, tan above average.....3
 Rarely burn, tan with ease.....4

HAND
CARD
M

11. In the summer, once you have already been in the sun several times, what reaction will your skin have the next time you go out in the sun for two or more hours on a bright day? Would you say you get

- A painful burn.....1 19/
 A burn.....2
 Some redness only.....3
 No reaction.....4

12. After repeated sun exposures, for example, a two week vacation outdoors, will your skin become . . .

- Only freckled or no sunken at all.....1 20/
 Only mildly tanned due to a tendency to peel.....2
 Moderately tanned.....3
 Very brown and deeply tanned.....4

HAND
CARD
M

13. HAND SELF-ADMINISTERED FORM 2. We would like you to tell us all the places you've lived since you were born. Please list all the places you've lived for more than 12 months starting with the first place since birth. Please take your time. It will probably take you 10 minutes or so to fill out this form. Please begin.

14. During any period in your life, did a doctor ever tell you that you had a peptic or stomach ulcer?

- Yes.....1 22/
 No.....(SKIP TO Q.24).....2

15. During what month and year did a doctor first tell you that you had a peptic or stomach ulcer?

Mo. | | | | | 23-26/
 Yr. | | | | |

16. What is the full name of the doctor who made the diagnosis or the medical facility where the diagnosis was made?

LAST

FIRST

OR

MIDDLE

FACILITY NAME

A. What is the address of that (doctor/medical facility)?

27/

STREET ADDRESS

CITY

(STATE)

17. Do you have a peptic or stomach ulcer now?

Yes.....1 28/
 No.....2

18. What month and year did you last consult a doctor for your peptic or stomach ulcer?

Mo. | | | | | 29-32/
 Yr. | | | | |

19. Have you ever during any period in your life had a bleeding ulcer?

Yes.....1 33/
 No.....(SKIP TO Q.21).....2

20. During what month(s) and year(s) did you have a bleeding ulcer?

| FROM | | THRU | | FROM | | THRU | |
|------|--------|------|--------|------|--------|------|----|
| Mo | Yr | Mo | Yr | Mo | Yr | Mo | Yr |
| 1 | 14-37/ | 1 | 42-45/ | 1 | 50-53/ | | |
| 2 | | 2 | | 2 | | | |
| 3 | | 3 | | 3 | | | |
| 4 | | 4 | | 4 | | | |
| 5 | | 5 | | 5 | | | |
| 6 | | 6 | | 6 | | | |
| 7 | | 7 | | 7 | | | |
| 8 | | 8 | | 8 | | | |
| 9 | | 9 | | 9 | | | |
| 10 | | 10 | | 10 | | | |
| 11 | | 11 | | 11 | | | |
| 12 | | 12 | | 12 | | | |

21. Were you ever (during any period in your life) hospitalized for your peptic or stomach ulcer?

Yes.....1 58/
No.....2

22. Have you ever (during any period in your life) had surgery for your peptic or stomach ulcer?

Yes.....1 59/
No.....2

23. Are you currently taking any prescribed medicines for your peptic or stomach ulcer?

Yes.....1 60/
No.....(SKIP TO Q.24).....2

A. What are the names of the medicines you are taking?
(PROB: WHAT OTHERS?)

1) _____ 61-63/
2) _____ 64-66/
3) _____ 67-69/

24. Please indicate which of the following members of your biological family have ever had a peptic or stomach ulcer?

| | |
|-----------------------|--------|
| 1. Mother.....01 | 70-71/ |
| 2. Father.....02 | 72-73/ |
| 3. Full Mother.....03 | 74-75/ |
| 4. Half Mother.....04 | 76-77/ |
| 5. Full Sister.....05 | 78-79/ |
| 6. Half Sister.....06 | 80-81/ |
| 7. None.....07 | 12-13/ |
| 8. Don't Know.....08 | 14-15/ |

25. Do you have or have you recently had sharp upper stomach pain?

Yes.....1 16/
No.....(SKIP TO Q.28).....2

26. Was this pain relieved by food, milk, or antacids?

Yes.....1 17/
No.....2

27. Was this stomach pain awakened you from sleep?

Yes.....1 18/
No.....2

28. Have you vomited blood recently?

Yes.....1 19/
No.....2

29. Have you recently experienced dark tar colored stools or bowel movements?

Yes.....1 20/
No.....2

Now I would like to ask you some questions that deal only with the period of time between (DATE OF LAST INTERVIEW) and now.

INTERVIEWER: ASK A THROUGH G FOR EACH CONDITION LISTED YES.

| | | A | | B | |
|----------------------|--------------|--|---------|--|-------|
| | | Between (DATE OF LAST INTERVIEW) and now, in what month and year did a doctor first tell you that you had (CONDITION)? | | What is the full name and address of the doctor who made the diagnosis or the medical facility where the diagnosis was made? | |
| | | Yes | No | | |
| 30. Diabetic | 1 2 21/ | 1 2 21/ | 1 2 21/ | | |
| | SKIP TO Q.31 | No | Yes | | |
| | | | 22-23/ | | |
| | | | | Last Name | 26/ |
| | | | | First Name | |
| | | | | UR | |
| | | | | Facility Name | |
| | | | | Street Address | |
| | | | | City | State |
| | | | | | |
| 31. Thyroid problem? | 1 2 21/ | 1 2 21/ | 1 2 21/ | | |
| (SPECIFY) | SKIP TO Q.32 | No | Yes | | |
| | | | 29-32/ | | |
| | | | | Last Name | 33/ |
| | | | | First Name | |
| | | | | UR | |
| | | | | Facility Name | |
| | | | | Street Address | |
| | | | | City | State |

PLEASE GO ON TO NEXT PAGE

What is the full name and address of the doctor who made the diagnosis or the medical facility where the diagnosis was made?

Between (DATE OF LAST INTERVIEW) and now, in what month and year did a doctor first tell you that you had (CONDITION)?

Since (DATE OF LAST INTERVIEW) has a doctor told you that you had ...

Yes No

32. Answered

1 2 34/ 55/ 65-66/ 67-70/ 71/ 72/ 73/ 74/ 75/ 76/ 77/ 78/ 79/ 80/ 81/ 82/ 83/ 84/ 85/ 86/ 87/ 88/ 89/ 90/ 91/ 92/ 93/ 94/ 95/ 96/ 97/ 98/ 99/ 100/

Last Name

First Name

OR

Facility Name

Street Address

City

State

33. A heart condition?

1 2 34/ 55/ 65-66/ 67-70/ 71/ 72/ 73/ 74/ 75/ 76/ 77/ 78/ 79/ 80/ 81/ 82/ 83/ 84/ 85/ 86/ 87/ 88/ 89/ 90/ 91/ 92/ 93/ 94/ 95/ 96/ 97/ 98/ 99/ 100/

Last Name

First Name

OR

Facility Name

Street Address

City

State

When did you last consult a doctor for (CONDITION)?

What are the names of medicines you are taking? Any others?

Do you have (CONDITION) now? Yes No

1 2 34/ 55/ 65-66/ 67-70/ 71/ 72/ 73/ 74/ 75/ 76/ 77/ 78/ 79/ 80/ 81/ 82/ 83/ 84/ 85/ 86/ 87/ 88/ 89/ 90/ 91/ 92/ 93/ 94/ 95/ 96/ 97/ 98/ 99/ 100/

Last Name

First Name

OR

Facility Name

Street Address

City

State

1 2 34/ 55/ 65-66/ 67-70/ 71/ 72/ 73/ 74/ 75/ 76/ 77/ 78/ 79/ 80/ 81/ 82/ 83/ 84/ 85/ 86/ 87/ 88/ 89/ 90/ 91/ 92/ 93/ 94/ 95/ 96/ 97/ 98/ 99/ 100/

Last Name

First Name

OR

Facility Name

Street Address

City

State

[illegible]

| A | | B | |
|---|---|--|--|
| Since (DATE OF LAST INTERVIEW) has a doctor told you that you had ... | Between (DATE OF LAST INTERVIEW) and now, in what month and year did a doctor first tell you that you had (CUMULATIVE)? | What is the full name and address of the doctor who made the diagnosis or the medical facility where the diagnosis was made? | |
| 36. Hepatitis | Yes No 1 2 15/ SKIP NO Q.37 | Last Name 20/ First Name UR | |
| | | Facility Name | |
| | | Street Address | |
| | | City State | |
| | | Last Name 26/ First Name UR | |
| | | Facility Name | |
| | | Street Address | |
| | | City State | |
| | | Last Name 26/ First Name UR | |
| | | Facility Name | |
| | | Street Address | |
| | | City State | |

| | | | |
|----------------------------|---|---|--|
| 37. Cirrhosis of the liver | Yes No 1 2 21/ SKIP NO Q.38 | Between (DATE OF LAST INTERVIEW) and now, in what month and year did a doctor first tell you that you had (CUMULATIVE)? 22-23/ | What is the full name and address of the doctor who made the diagnosis or the medical facility where the diagnosis was made? Last Name 26/ First Name UR Facility Name Street Address City State |
|----------------------------|---|---|--|

| A | | B | |
|---|--|--|--|
| Since (DATE OF LAST INTERVIEW) has a doctor told you that you had ... | Between (DATE OF LAST INTERVIEW) and now, in what month and year did a doctor first tell you that you had (CONDITION)? | What is the full name and address of the doctor who made the diagnosis or the medical facility where the diagnosis was made? | |
| Yes | No | | |
| 1 | 2 39/ | | |
| SKIP | No | | |
| TO | 60-63/ | | |
| 0-39 | | | |
| | | Last Name | |
| | | First Name | |
| | | OR | |
| | | Facility Name | |
| | | Street Address | |
| | | City | |
| | | State | |
| | | | |
| | | Last Name | |
| | | First Name | |
| | | OR | |
| | | Facility Name | |
| | | Street Address | |
| | | City | |
| | | State | |

| C | | D | |
|------------------------------|--|---|--|
| Do you have (CONDITION) now? | When did you last consult a doctor for (CONDITION) between (DATE OF LAST INTERVIEW) and now? | What is the full name and address of the doctor or medical facility you last consulted? | |
| Yes | No | | |
| 1 | 2 27/ | | |
| SKIP | No | | |
| TO | 30-41/ | | |
| 0 | | | |
| | | Last Name | |
| | | First Name | |
| | | OR | |
| | | Facility Name | |
| | | Street Address | |
| | | City | |
| | | State | |
| | | | |
| | | Last Name | |
| | | First Name | |
| | | OR | |
| | | Facility Name | |
| | | Street Address | |
| | | City | |
| | | State | |

[illegible]

Since (DATE OF LAST INTERVIEW) has a doctor told you that you had ...

Between (DATE OF LAST INTERVIEW) and now, in what month and year did a doctor first tell you that you had (CONJUNCTION)?

Yes No

42. A respiratory condition other than pneumonia? (SPECIFY) _____ 11/

1 2 10/ SKIP TO 0.43

43. Any other major condition? 1 2 11/ SKIP TO 0.44

(SPECIFY) _____ 10/

What is the full name and address of the doctor who made the diagnosis or the medical facility where the diagnosis was made?

Last Name 10/

First Name

OR

Facility Name

Street Address

City State

Last Name 23/

First Name

OR

Facility Name

Street Address

City State

What is the full name and address of the doctor who made the diagnosis or the medical facility where the diagnosis was made?

Name, our long wheel month and year did a doctor first tell you that you had (DMD) (LMD) ()

Yes No

1 2 3 4

5 6 7 8 9 10 11 12

13 14 15 16 17 18 19 20 21 22 23 24

25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200

201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300

301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400

401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500

501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600

601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700

701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800

801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900

901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000

1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 10

| Do you have (COMBINATION) name? | | Are you cur- rently taking any prescribed medications for your (COMBINATION) name? | | What are the names of medicines you are taking? What other? | | When did you last consult a doctor for (COMBINATION) between (DATE) or (LAST (DATE) (DATE) and next | | What is the full name and address of the doctor or medical facility you last consulted | |
|---------------------------------------|---|---|------|--|-----|---|-----|--|-----|
| 1 | 2 | 2a/ | 2 | 2b/ | 2c/ | 2d/ | 2e/ | 2f/ | 2g/ |
| | | SHIP | SHIP | | | | | | |
| | | 10 | 10 | | | | | | |
| | | P | P | | | | | | |
| 1 | 2 | 2a/ | 2 | 2b/ | 2c/ | 2d/ | 2e/ | 2f/ | 2g/ |
| | | SHIP | SHIP | | | | | | |
| | | 10 | 10 | | | | | | |
| | | P | P | | | | | | |
| 1 | 2 | 2a/ | 2 | 2b/ | 2c/ | 2d/ | 2e/ | 2f/ | 2g/ |
| | | SHIP | SHIP | | | | | | |
| | | 10 | 10 | | | | | | |
| | | P | P | | | | | | |

First Name

City

State

First Name

City

State

First Name

City

State

45. At any time since (DATE OF LAST INTERVIEW) has a doctor told you that you had cancer?

Yes.....1 10/

No....(SKIP TO 0.49).....2

46. Did the doctor tell you that this was a skin cancer or a systemic (body) cancer?

Skin cancer only.....1 11/

Systemic cancer only.....(SKIP TO 0.48).....2

BOTH SKIN AND SYSTEMIC CANCER.....3

SKIN CANCER ONLY

47. Please look at this chart and tell me where each of your skin cancers (if/when) located.

INTERVIEWER, INDICATE THE ANATOMICAL CODE FOR EACH SITE BEING REPORTED.

SITE NUMBER

1 2 3

SITE CODE

13-15/ 16-17/ 18-19/

HEAD
C AND
J

CODES:

(01) Scalp or forehead (14) Arm or hand, not otherwise specified
(02) Eye lid (15) Genitals
(03) Ear (16) Leg
(04) Nose (17) Foot
(05) Head or neck, not otherwise specified (18) Leg or foot, not otherwise specified
(06) Cheek, chin or jaw (19) Mouth, not otherwise specified
(07) Neck or suprascapular (20) Upper lip, not otherwise specified
(08) Ventrals (21) Lower lip, not otherwise specified
(09) Trunk, front (22) Lip, not otherwise specified
(10) Trunk, back
(11) Trunk, not otherwise specified
(12) Arm
(13) Hand

What are the names of medicines you are taking? What others?

1) 2) 3)

ON

Facility Name

Street Address

City State

INTERVIEWER: FOR EACH SITE REPORTED AS A THROUGH P

PRIM CAM'28 ONLY

[illegible]

48. (Continued)

DECEMBER 46-47

'45

SYSTEMIC (BODY) CANCER (ONLY)

48.

BODY PART 1

A. In what part of your body (its/vas) cancer located (RECORD VERBATIM) 26-45/

B. What kind of cancer was it? 46/

C. In what month and year was cancer of the (BODY PART) first diagnosed? 47-50/

BODY PART 2

A. In what part of your body (its/vas) cancer located? (RECORD VERBATIM) 51-70/

B. What kind of cancer was it? 71/

C. In what month and year was cancer of the (BODY PART) first diagnosed? 72-75/

BODY PART 3

A. In what part of your body (its/vas) cancer located? (RECORD VERBATIM) 10-29/

B. What kind of cancer was it? 30/

C. In what month and year was cancer of the (BODY PART) first diagnosed? 31-34/

BODY PART 1

D. What is the full name and address of the doctor or the medical facility where the diagnosis was made?

Last Name 35/

First Name

OR

Facility Name

Street Address

City

State

E. What treatments or medicines (do/did) you take for cancer of the (BODY PART)? CODE ALL THAT APPLY

Radiation.....1 36/

Chemotherapy.....2 37/

Surgery.....3 38/

Other (SPECIFY)....4 39/

NONE.....0

BODY PART 2

D. What is the full name and address of the doctor or the medical facility where the diagnosis was made?

Last Name 40/

First Name

OR

Facility Name

Street Address

City

State

E. What treatments or medicines (do/did) you take for cancer of the (BODY PART)? CODE ALL THAT APPLY

Radiation.....1 41/

Chemotherapy.....2 42/

Surgery.....3 43/

Other (SPECIFY)....4 44/

NONE.....0

BODY PART 3

D. What is the full name and address of the doctor or the medical facility where the diagnosis was made?

Last Name 45/

First Name

OR

Facility Name

Street Address

City

State

E. What treatments or medicines (do/did) you take for cancer of the (BODY PART)? CODE ALL THAT APPLY

Radiation.....1 46/

Chemotherapy.....2 47/

Surgery.....3 48/

Other (SPECIFY)....4 49/

NONE.....0

BUDY PART I

| SURGEON | | MO | | YR | | 50-61/ |
|---------|---|----|---|----|---|--------|
| 1 | 2 | 3 | 4 | 5 | 6 | |
| 1 | 2 | 3 | 4 | 5 | 6 | |
| OTHER | | | | | | 62-65/ |
| 1 | 2 | 3 | 4 | 5 | 6 | |

Mo.. (SKIP TO
Q.49).....2661

ANNEX PART 2

SURGERY [] MO [] YR
 75-79/
 BEGIN DEC 40
 OTHER [] MO [] YR
 10-13/

NO. (SKIP TO
Q.49).....214/

ONLY PART 3

| | NO | YR | |
|---------|----|----|--------|
| SURGERY | 1 | 1 | 23-26/ |
| OTHER | 1 | 1 | 27-30/ |

Do..(SKIP TO
Q.49).....2
11/

YES.....(ASK A F).....1 12/
NO.....(G T) (0.51).....2 -

No. _____

33-36/

3. What is the name and address of the doctor of the medical facility where the diagnosis was made?

LESS 24

Final Name

2

Facility Name

Street Address

01015

12. What treatments or medicines have you taken for leukemia since (DATE OF LAST INTERVIEW)?

| | |
|---|--------|
| 1 | 18-40/ |
| 1 | 41-43/ |
| 1 | 44-46/ |

9. For the period between (DATE OF LAST INTERVIEW) and now, during what month and year did you first receive (EM/M TREATMENT OR MEDICINE IN C)?

| | Mo. | Tr. | |
|-------------|-----|-----|--------|
| TREATMENT 1 | 1 | 1 | 47-502 |
| TREATMENT 2 | 1 | 1 | 51-547 |
| TREATMENT 3 | 1 | 1 | 55-587 |

50. (Continued)

E. During what month and year was the last consultation with the doctor or medical facility you last consulted about (COMBILION)?

F. What is the name and address of the doctor or medical facility you last consulted about (COMBILION)?

G. During what month and year did you last consult (COMBILION)?

10-16/ 10-21/

Mo. Yr. Mo. Yr.

Last Name _____

First Name _____

Facility Name _____

Street Address _____

City _____ State _____

10-22/ 10-23/

Mo. Yr. Mo. Yr.

Last Name _____

First Name _____

Facility Name _____

Street Address _____

City _____ State _____

A. Did you discuss (COMBILION) with a doctor? Yes No

B. Did you discuss (COMBILION) with a doctor? Yes No

C. What is the doctor's name and address? _____

D. What is the doctor's name and address? _____

E. What is the doctor's name and address? _____

F. What is the doctor's name and address? _____

G. What is the doctor's name and address? _____

5. Skin that was extra sensitive or seemed to hurt for no reason? 1 2 3/

Site Code 32-33/ 34-35/ 36-37/

Last Name _____

First Name _____

Facility Address _____

City _____ State _____

QUESTIONS FOR Q.50

- QUESTIONS FOR Q.50
- (10) Scalp or forehead Specified
- (11) Eye lid Specified
- (12) Ear Specified
- (13) Nose Specified
- (14) Head or neck, not otherwise Specified
- (15) Chest, chin or jaw Specified
- (16) Neck or back of neck Specified
- (17) Forearm Specified
- (18) Wrist, hand, or fingers Specified
- (19) Arm Specified
- (20) Shoulder, upper arm, or elbow Specified
- (21) Forearm Specified
- (22) Hand, wrist, or fingers Specified
- (23) Arm Specified
- (24) Head or neck, not otherwise Specified
- (25) Chest, chin or jaw Specified
- (26) Neck or back of neck Specified
- (27) Forearm Specified
- (28) Wrist, hand, or fingers Specified
- (29) Arm Specified
- (30) Shoulder, upper arm, or elbow Specified
- (31) Forearm Specified
- (32) Hand, wrist, or fingers Specified
- (33) Arm Specified

ASK A THROUGH J FOR EACH YES

50. (Continued)

A. Thinking about the period between (DATE OF LAST INTERVIEW) and now, when did you first notice (COMBITION)?

B. Which limbs or muscles were affected?

C. Do you still have (COMBITION)?

Aside from major T, since (DATE OF LAST INTERVIEW) have you had . . .

Yes No

Yes No

4. Persistent numbness of any of your limbs? 1 2 30/ No. Tr. 31-34/

1 2 31/

35-36/

5. Persistent tingling sensations in any of your limbs? 1 2 30/ No. Tr. 31-34/

1 2 31/

35-36/

E. What is the name and address of the doctor or medical facility you last consulted about (COMBITION)?

G.

During what month and year did you last consult (NAME FROM H)?

Last Name

Mo. Tr. 40-49/

First Name

OR

Facility Name

Street Address

City State

| | | | |
|---|---|-------------------------|--|
| Form (DATE OF LAST EXAMINATION) and num. bearing their number (and year) on the (CONTINUATION) next interview? | Did you see a doctor for (SYMPTOM)? | What was the diagnosis? | What is the name and address of the doctor who made the diagnosis at the medical facility where the diagnosis was made? |
| Yes No | Yes No | Last Name | |
| 1 2 34 | | First Name | ON |
| SHIP 10 5 | YES | Facility Name | |
| 10-13/ Tr. | | Street Address | |
| 10 Tr. | | City | State |



| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Mo. | 1 | Tu. | 2 | We. | 3 | Th. | 4 | Fr. | 5 | Sa. | 6 | Su. | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| TO BEGIN DEC. 30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TO 0.31 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 71-80/ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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ASK A THROUGH J FOR EACH YES

| A. | B. | C. |
|---|---------------------------------------|---------------------------------|
| Thinking about the period between (DATE OF LAST INTERVIEW) and now, when did you first notice (COMMITMENT)? | Which limbs or muscles were affected? | Do you still have (COMMITMENT)? |
| Yes No | | Yes No |

31. Aside from injury, since (DATE OF LAST INTERVIEW) have you had . . .

| | | |
|--|--------|---------|
| 1. Persistent deep burning sensations in any of your limbs | Yes No | 1 2 42/ |
| | | |
| | | 40-41/ |

PLEASE GO ON TO NEXT PAGE

| | | |
|--|--------|---------|
| 2. Persistent aches and pains in any of your limbs | Yes No | 1 2 50/ |
| | | |
| | | 48-49/ |

31. (Continued)

Between (DATE OF LAST INTERVIEW) and now, during what month and year (s) was the (CONDITION) most intense?

Did you see a doctor for (CONDITION)?

What was the diagnosis?

What is the name and address of the doctor who made the diagnosis or the medical facility where the diagnosis was made?

Yes No

Mo. Yr. 51-52/ 1 2 34/ 51/

10 10 2

Mo. Yr. 53-54/ 60/

Last Name _____

First Name _____ ON

Facility Name _____

Street Address _____

City _____ State _____



Mo. Yr. 57-58/ 1 2 34/ 52/

10 10 2

Mo. Yr. 59-60/ 51/

Last Name _____

First Name _____ ON

Facility Name _____

Street Address _____

City _____ State _____



31. (Continued)

During what month and year was that?

What is the name and address of the doctor or medical facility you last consulted about (CONDITION)?

During what month and year did you last consult (NAME FROM 11)?

BEGIN DATA 51

Mo. Yr. 55-56/ 51/ 10-13/

Mo. Yr. 56-57/ 10-13/

Last Name _____

First Name _____ ON

Facility Name _____

Street Address _____

City _____ State _____

Mo. Yr. 58-59/ 10-13/ 10-13/

Mo. Yr. 59-60/ 10-13/

Last Name _____

First Name _____ ON

Facility Name _____

Street Address _____

City _____ State _____

ASK A THROUGH J FOR EACH YES

| | A. | B. | C. |
|--|-----|---------------------------------------|--------------------------------|
| Thinking about the period between (DATE OF LAST INTERVIEW) and now, when did you first notice (CONDITION)? | | Which limbs or muscles were affected? | Do you still have (CONDITION)? |
| 52. Aside from injury, since (DATE OF LAST INTERVIEW) have you had . . . | Yes | No | |

| | Yes | No |
|---------------------------------|-----|-----|
| 1. A reduction in grip strength | 1 | 2 |
| 20-20/ | | |
| 24-24/ | | |
| No. Yr. | | |
| 1 | 2 | 30/ |

PLEASE GO ON TO NEXT PAGE

52. (Continued)

0 Did you see a doctor for (CONDITION)? Yes No

1 From (DATE OF LAST INTERVIEW) and now, during what month and year(s) was the (CONDITION) most intense?

2 What was the diagnosis?

3 What is the name and address of the doctor or medical facility you last consulted about (CONDITION)?

4 During what month and year did you last consult (about (CONDITION))?

Mo. Yr. 31-34/

Mo. Yr. 35-38/

Mo. Yr. 39-42/

Mo. Yr. 43-46/

Mo. Yr. 47-50/

Mo. Yr. 51-54/

Mo. Yr. 55-58/

Mo. Yr. 59-62/

Mo. Yr. 63-66/

Mo. Yr. 67-70/

Mo. Yr. 71-74/

Mo. Yr. 75-78/

Mo. Yr. 79-82/

Mo. Yr. 83-86/

Mo. Yr. 87-90/

Mo. Yr. 91-94/

Mo. Yr. 95-98/

Mo. Yr. 99-02/

Mo. Yr. 03-06/

Mo. Yr. 07-10/

Mo. Yr. 11-14/

Mo. Yr. 15-18/

Mo. Yr. 19-22/

Mo. Yr. 23-26/

Last Name

First Name

Facility Name

Street Address

City

State

Mo. Yr. 41/

Mo. Yr. 42-45/

Mo. Yr. 46/

Mo. Yr. 47-50/

Mo. Yr. 51-54/

Mo. Yr. 55-58/

Mo. Yr. 59-62/

Mo. Yr. 63-66/

Mo. Yr. 67-70/

Mo. Yr. 71-74/

Mo. Yr. 75-78/

Mo. Yr. 79-82/

Mo. Yr. 83-86/

Mo. Yr. 87-90/

Mo. Yr. 91-94/

Mo. Yr. 95-98/

Mo. Yr. 99-02/

Mo. Yr. 03-06/



53. (besides the prescribed medicines you told me about) are you currently taking any (other) prescribed medicines?

Yes.....(ASK A).....1 51/
No....(SKIP TO SECTION 8)....2

A. For what conditions are the medicines? What other conditions?

1) _____ 52/
2) _____
3) _____

SECTION 8: HEALTH HABITS

The next set of questions refers to smoking habits.

1. Have you ever smoked at least as many as 5 packs of cigarettes, that is, 100 cigarettes, during your entire life?

Yes.....1 53/
No.....(SKIP TO 0.22).....2

2. Do you now smoke cigarettes?

Yes.....1 54/
No.....(SKIP TO 0.11).....2

CURRENT CIGARETTE SMOKER SECTION

3. On average, how many cigarettes do you smoke a day?

INTERVIEWER: IF R ANSWERS BY GIVING NUMBER OF PACKS OF CIGARETTES, RECORD VERBATIM. THEN MULTIPLY THE NUMBER OF PACKS BY 20 AND ENTER THE NUMBER OF CIGARETTES SMOKED.

ENTER NUMBER OF CIGARETTES PER DAY: [] [] 55-56/
(IF NOT EVERY DAY) 0 [] [] PER MONTH 57-58/

OR

(IF NOT EVERY DAY) 0 [] [] PER YEAR 59-60/

4. For how many years have you been smoking (NUMBER IN 0.3) (cigarettes per day/per month/per year)?

Less than 2 years.....01 61-62/
2-5 years.....02
6-10 years.....02
11-15 years.....03
16-20 years.....04
21-25 years.....05
26-30 years.....06
31-35 years.....08
36-40 years.....09
More than 40 years.....10

HAND
CARD
R

5. What brand of cigarettes do you usually smoke? (IF MORE THAN ONE BRAND OR NO REGULAR BRAND MENTIONED ABOVE, WHICH ONE DO YOU SMOKE THE MOST?)

ENTER BRAND _____ OFFICE USE
No regular brand.....996

6. For how long now have you been smoking this particular brand?

ENTER DATE: 66-67/
OR WEEKS: 68-69/
OR MONTHS: 70-71/
OR YEARS: 72-73/

7. What type of cigarettes are they? Are they . . . (NAME EACH PAIR TOGETHER)

A. Filter tip of.....1 74/
Non filter tip?.....2
B. Regular size.....1 75/
King size of.....2
100 millimeter?.....3

8. Now I am going to show you a diagram of different size cigarettes. Please look at the picture of the (KIND OF CIGARETTE IN 0.7A AND 0.7B). Now, considering your style of smoking--for example, how long you usually leave the cigarette in an ashtray or just hold it in your hand--tell me the number which indicates how much of the cigarette you actually smoke.

Section 1.....1 76/
Section 2.....2
Section 3.....3
Section 4.....4

HAND
CARD
S

9. During the period when you were smoking the most heavily on a regular basis, about how many cigarettes did you usually smoke in a day?

ENTER NUMBER: PER DAY 77-78/
(IF NOT EVERY DAY) 0 PER MONTH 79-80/
OR
(IF NOT EVERY DAY) 0 PER YEAR 10-11/
REG. IN USE 52

A. When was that?

FROM 12-15/
NO Yr
TO 16-19/
NO Yr

10. When you smoke cigarettes, how deeply do you usually inhale? Would you say:

- As deeply into the chest as possible.....1 20/
 Only partly into the chest.....2
 As far back as the throat.....3
 Well back into the mouth, or.....4
 Just puff and don't really draw it in at all.....5
 I DON'T KNOW.....6

HAND
CARD
T

SKIP TO Q-22

FORMER CIGARETTE SMOKER SECTION

11. How long has it been since you smoked cigarettes fairly regularly (RECORD NUMBER)

- ENTER DATE: 21-22/
 OR WEEKS: 23-24/
 OR MONTHS: 25-26/
 OR YEARS: 27-28/
 NEVER SMOKED REGULARLY.....(SKIP TO Q-22).....1 29/

12. On the average, about how many cigarettes a day were you smoking at that time?

INTERVIEWER: IF A ANSWER BY GIVING NUMBER OF PACKS OF CIGARETTES, RECORD VERBATIM. THEN MULTIPLY THE NUMBER OF PACKS BY 20 AND ENTER THE NUMBER OF CIGARETTES SMOKED.

- ENTER NUMBER OF CIGARETTES PER DAY: 30-31/
 (IF NOT EVERY DAY:) 0 PER MONTH 32-33/
 OR
 (IF NOT EVERY DAY:) 0 PER YEAR 34-35/

13. How long had you been smoking (NUMBER IN Q-12) (cigarettes per day/per week/per month)?

- Less than 2 years.....01 36-37/
 2-5 years.....02
 6-10 years.....03
 11-15 years.....04
 16-20 years.....05
 21-25 years.....06
 26-30 years.....07
 31-35 years.....08
 36-40 years.....09
 More than 40 years.....10

HAND
CARD
R

14. You mentioned that you have not smoked regularly for (TIME IN Q-11). Did you ever stay off cigarettes for a longer period of time?

- Yes.....1 38/
 No.....(SKIP TO Q-16).....2

15. How long did you stay off cigarettes at that time?

- ENTER DATE: 39-40/
 OR WEEKS: 41-42/
 OR MONTHS: 43-44/
 OR YEARS: 45-46/

16. What brand of cigarettes did you usually smoke just before you stopped smoking cigarettes regularly? (IF MORE THAN ONE BRAND OR NO REGULAR BRAND MENTIONED, ASK: Which one did you smoke the most?)

OFFICE USE

- ENTER BRAND:
 No regular brand.....996 47-49/

17. For how long did you smoke this particular brand?

ENTER DAYS: [] [] [] 50-51/
 OR WEEKS: [] [] [] 52-53/
 OR MONTHS: [] [] [] 54-55/
 OR YEARS: [] [] [] 56-57/

18. What type of cigarettes were they?

CORE ONE
 A. Filter tip or.....1 58/
 Non-filter tip?.....2
 CORE ONE
 B. Regular size.....1 59/
 King size of.....2
 100 Millimeter?.....3

19. Now I am going to show you a diagram of different size cigarettes. Please look at the picture of the (KING OF CIGARETTES IN 0.10A AND 0.10B). Now, considering your style of smoking--for example, how long you usually leave the cigarette in an ashtray or just hold it in your hand--tell me the number which indicates how much of the cigarette you actually smoked.

Section 1.....1 60/
 Section 2.....2
 Section 3.....3
 Section 4.....4

RAND
CARD
B

20. During the period when you were smoking the most heavily on a regular basis, about how many cigarettes did you usually smoke in a day?

ENTER NUMBER: [] [] [] PER DAY 63-62/
 (IF NOT EVERY DAY:) 0 [] [] PER MONTH 63-64/
 OR
 (IF NOT EVERY DAY:) 0 [] [] PER YEAR 65-66/

A. When was that?

FROM
 [] [] [] []
 No Yr 67-70/
 TO
 [] [] [] []
 No Yr 71-74/

21. When you smoked cigarettes, how deeply did you usually inhale? Would you say:

As deeply into the chest as possible.....1 75/
 Only partly into the chest.....2
 As far back as the throat3
 Well back into the mouth, or.....4
 Just puff and don't really draw it in at all.....5
 DON'T KNOW.....8

RAND
CARD
T

CURRENT PIPE SMOKER SECTION

22. During your entire life, have you smoked at least as many as 50 pipefuls of tobacco?

Yes.....1 76/
 No.....(SKIP TO 0.35).....2

23. Do you now smoke a pipe?

Yes.....1 77/
No.....(SKIP TO Q.28).....2

24. About how many average sized pipefuls of tobacco do you usually smoke in a day?

ENTER NUMBER OF PIPEFULS OF TOBACCO PER DAY: 78-79/
BRAIN DECK 53
(IF NOT EVERY DAY,) 0 PER MONTH 10-11/
OR
(IF NOT EVERY DAY,) 0 PER YEAR 12-13/

25. For how many years have you been smoking (NUMBER IN Q.24) (pipefuls per day/per month/per year)?

Less than 2 years.....01 14-15/
2-5 years.....02
6-10 years.....02
11-15 years.....03
16-20 years.....04
21-25 years.....05
26-30 years.....06
31-35 years.....08
36-40 years.....09
More than 40 years.....10

HAND
CARD
R

26. During the period when you were smoking the most heavily, about how many pipefuls of tobacco did you usually smoke in a day?

ENTER NUMBER: PER DAY 16-17/
(IF NOT EVERY DAY,) 0 PER MONTH 18-19/
OR
(IF NOT EVERY DAY,) 0 PER YEAR 20-21/

26. (Continued)

A. When was that?

FROM
 22-25/
Mo Yr

TO
 26-29/
Mo Yr

27. When you smoke a pipe, how deeply do you usually inhale? Would you say:

As deeply into the chest as possible.....1 30/
Only partly into the chest.....2
As far back as the throat.....3
Well back into the mouth, or.....4
Just puff and don't really draw it in at all.....5
DON'T KNOW.....R
(SKIP TO Q.35)

HAND
CARD
T

FORMER PIPE SMOKE SECTION

28. How long has it been since you smoked a pipe fairly regularly? (RECORD NUMBER)

ENTER DAYS: 31-32/
OR WEEKS: 33-34/
OR MONTHS: 35-36/
OR YEARS: 37-38/
NEVER SMOKED REGULARLY.....(SKIP TO Q.35).....19/

29. On the average, about how many pipefuls of tobacco a day were you smoking at that time?

ENTER NUMBER OF PIPEFULS OF TOBACCO PER DAY: 40-41/
(IF NOT EVERY DAY,) 0 PER MONTH 42-43/
OR
(IF NOT EVERY DAY,) 0 PER YEAR 44-45/

10. How long did you smoke (NUMBER IN Q.29) (pipefuls of tobacco per day/per week/per month)?

- Less than 2 years.....01 46-47/
- 2-5 years.....02
- 6-10 years.....03
- 11-15 years.....04
- 16-20 years.....05
- 21-25 years.....06
- 26-30 years.....07
- 31-35 years.....08
- 36-40 years.....09
- 40 or more years.....10

HAND
CAND
T

CURRENT CIGAR SMOKER SECTION

34. When you smoked a pipe, how deeply did you usually inhale? Would you say:

- As deeply into the chest as possible.....1 71/
- Only partly into the chest.....2
- As far back as the throat.....3
- Well back into the mouth, or.....4
- Just puff and don't really draw it in at all.....5
- DON'T KNOW.....6

35. During your entire life have you smoked at least as many as 50 cigars?

- Yes.....1 72/
- No.....(SKIP TO Q.51).....2

36. Do you now smoke cigars?

- Yes.....1 73/
- No.....(SKIP TO Q.42).....2

37. On average, about how many cigars a day do you now smoke?

ENTER NUMBER OF CIGARS PER DAY:
(IF NOT EVERY DAY:) 0 PER MONTH
OR
(IF NOT EVERY DAY:) 0 PER YEAR

74-75/
76-77/
78-79/

10. How long did you smoke (NUMBER IN Q.29) (pipefuls of tobacco per day/per week/per month)?

- Less than 2 years.....01 46-47/
- 2-5 years.....02
- 6-10 years.....03
- 11-15 years.....04
- 16-20 years.....05
- 21-25 years.....06
- 26-30 years.....07
- 31-35 years.....08
- 36-40 years.....09
- 40 or more years.....10

31. You mentioned that you have not smoked regularly for (TIME IN Q.30). Did you ever not smoke a pipe for a longer period of time?

- Yes.....1 46/
- No.....(SKIP TO Q.33).....2

32. How long did you not smoke a pipe at that time?

- ENTER DAYS: 49-50/
- OR WEEKS: 51-52/
- OR MONTHS: 53-54/
- OR YEARS: 55-56/

33. During the period when you were smoking the most heavily on a regular basis, about how many pipefuls of tobacco did you usually smoke in a day?

- ENTER NUMBER: PER DAY 57-58/
- (IF NOT EVERY DAY:) 0 PER MONTH 59-60/
- OR
(IF NOT EVERY DAY:) 0 PER YEAR 61-62/

A. When was that?

- FROM 63-66/
- TO 67-70/

18. For how many years have you been smoking (8 in 0-17) cigars per day/per month/per year?

less than 2 years.....01 10-11/
 2-5 years.....02
 6-10 years.....03
 11-15 years.....04
 16-20 years.....05
 21-25 years.....06
 26-30 years.....07
 31-35 years.....08
 36-40 years.....09
 More than 40 years.....10

NAME
(CARD)
R

19. During the period when you were smoking the most heavily on a regular basis, about how many cigars did you usually smoke in a day.

ENTER NUMBER: PER DAY
 (IF NOT EVERY DAY) 0 PER MONTH
 OR
 (IF NOT EVERY DAY) 0 PER YEAR

A. When was that?

FROM
 NO YR
 TO
 NO YR

18-21/

22-25/

40. When you smoke cigars, how deeply do you usually inhale? Would you say:

As deeply into the chest as possible.....1 26/
 Only partly into the chest.....2
 As far back as the throat.....3
 Well back into the mouth, of.....4
 Just puff and don't really draw it in at all.....5
 DON'T KNOW.....9

NAME
(CARD)
T

41. What type of cigars do you usually smoke?

Filter tip or.....1 CODE ONE 21/
 Non-filter tip.....2

A. Now I am going to show you a diagram of different size cigars. Please look at the picture of the label of CIGAR 10 0-41). Now considering your style of smoking--for example, how long you usually leave the cigar in an ashtray or just hold it in your hand--tell me the number which indicates how much of the cigar you actually smoke.

Section 1.....1 28/
 Section 2.....2
 Section 3.....3
 Section 4.....4

NAME
(CARD)
U

SKIP TO Q-51

FORMER CIGAR SMOKER SECTION

42. How long has it been since you smoked cigars fairly regularly?

ENTER DAYS: 29 30/
 OR WEEKS: 31 32/
 OR MONTHS: 31 34/
 OR YEARS: 35 36/
 NEVER SMOKED REGULARLY.....(SKIP TO Q-51).....1

43. On the average, about how many cigars a day were you smoking at that time?

ENTER NUMBER OF CIGARS PER DAY: 10 19/
(IF NOT EVERY DAY) 0 PER MONTH 40-41/

OR

(IF NOT EVERY DAY) 0 PER YEAR 42-43/

44. For how long did you smoke (NUMBER PER DAY IN 0.43) cigars per day?

Less than 2 years.....01 44-45/
2-5 years.....02
6-10 years.....03
11-15 years.....04
16-20 years.....05
21-25 years.....06
26-30 years.....07
31-35 years.....08
36-40 years.....09
More than 40 years.....10

HAND
CARD
U

45. You mentioned that you have not smoked regularly for (TIME IN 0.42). Did you ever stay off cigars for a longer period of time?

Yes.....1 46/
No.....(SKIP TO 0.47).....2

46. How long did you stay off cigars at that time?

ENTER DAYS: 47-48/
OR WEEKS: 49-50/
OR MONTHS: 51-52/
OR YEARS: 53-54/

47. What type of cigars did you usually smoke just before you stopped smoking cigars regularly?

ENTER NAME 55/
Filter tip or.....1
Non filter tip.....2

48. Now I am going to show you a diagram of different size cigars. Please look at the picture of the (KIND OF CIGAR IN 0.47). Now, considering your style of smoking—for example, how long you usually leave the cigar in an ashtray or just hold it in your hand—tell me the number which indicates how much of the cigar you actually smoke.

Section 1.....1 56/
Section 2.....2
Section 3.....3
Section 4.....4

HAND
CARD
U

49. During the period when you were smoking the most on a regular basis, about how many cigars did you usually smoke in a day?

ENTER NUMBER: PER DAY 57-58/
(IF NOT EVERY DAY) 0 PER MONTH 59-60/
OR
(IF NOT EVERY DAY) 0 PER YEAR 61-62/

A. When was that?

FROM 63-66/
Mo Yr

TO 67-70/
Mo Yr

50. When you smoked a cigar, how deeply did you usually inhale? Would you say,

- As deeply into the chest as possible.....1 71/
 Only partly into the chest.....2
 As far back as the throat.....3
 Well back into the mouth, or.....4
 Just puff and don't really draw it in at all.....5
 I DON'T KNOW.....6

HAND
CARD
T

51. INTERVIEWER: DOES R CURRENTLY HAVE A SPOUSE OR PARTNER? (IS ANY "NO" CODED IN SECTION 5, Q's 2, 6C or 8C?)

- YES.....1 72/
 NO.....(SKIP TO Q.53).....2

52. Does your (spouse/partner) smoke regularly any of the following?

| | YES | NO | DON'T KNOW | |
|------------|-----|----|------------|-----|
| Cigarettes | 1 | 2 | 0 | 73/ |
| Cigars | 1 | 2 | 0 | 74/ |
| Pipe | 1 | 2 | 0 | 75/ |

53. Approximately how much smoke is there in the air in your home?

- A lot.....1 76/
 A little.....2
 None.....(SKIP TO Q.56).....3

54. Approximately how many hours a week are you exposed to this smoke in your home?

- 10 hours or less.....1 77/
 11 to 15 hours.....2
 16 to 20 hours.....3
 21 to 25 hours.....4
 26 or more hours.....5

HAND
CARD
V

55. For how many years have you been exposed to smoke in this way? (CHECK ONLY ONE)

- Less than 1 year.....01 78-79/
 1 to 4 years.....02
 5 to 10 years.....03
 11 to 15 years.....04
 16 to 20 years.....05
 21 to 30 years.....06
 More than 30 years.....07
 Don't know.....98

HAND
CARD
W

BE:IN DEK 55

56. INTERVIEWER: DOES R WORK? (IS "YES" CODED AT SEC 2, Q. 4 OR "CURRENT JOB" CODED AT SEC 3, Q. 1F?)

- Yes.....1 10/
 No.....(SKIP TO Q.62).....2

A. Approximately how much smoke is there in the air in the transportation you take to and from work (For example, your car, the train, the bus, etc.)?

- A lot.....1 11/
 A little.....2
 None.....(SKIP TO Q.59).....3

57. Approximately how many hours a week are you exposed to this smoke?

10 hours or less.....1 12/
11 to 15 hours.....2
16 to 20 hours.....3
21 to 25 hours.....4
26 or more hours.....5

HAND
CARD
V

58. For how many years have you been exposed to this smoke?

Less than 1 year.....01 13-14/
1 to 4 years.....02
5 to 10 years.....03
11 to 15 years.....04
16 to 20 years.....05
21 to 30 years.....06
More than 30 years.....07
Don't know.....99

HAND
CARD
W

59. Approximately how much smoke is there in the air where you work?

A lot.....1 15/
A little.....2
None.....(SKIP TO Q-62)....3

HAND
CARD
V

60. Approximately how many hours a week are you exposed to this smoke?

10 hours or less.....1 16/
11 to 15 hours.....2
16 to 20 hours.....3
21 to 25 hours.....4
26 or more hours.....5

61. For how many years have you been exposed to this smoke at work?

Less than 1 year.....01 17-18/
1 to 4 years.....02
5 to 10 years.....03
11 to 15 years.....04
16 to 20 years.....05
21 to 30 years.....06
More than 30 years.....07

HAND
CARD
W

62. There are some questions that are asked in survey research that are difficult to ask directly because many people think they are too personal. While it is understandable that people feel this way, there is a real need for the information for the population as a whole. We now have a way that makes it possible for people to give information, without telling anyone about their own situation. Let me show you how this works; we will use the next question I have here as an example. HAND A CARD X. As you see, there are two questions on the card. One deals with the "real" question that the research is concerned with, the other is completely unrelated. Both questions can be answered "yes" or "no." One of the two questions is selected by chance and you answer it. (I'll show you how that works in a minute). I do not know which question you are answering. When all the questionnaires have been tallied, the researchers can tell how many people have smoked marijuana, but they have no way of knowing whether it was you or any other person in particular who has smoked marijuana.

HAND
CARD
X

HAND A COIN

It is very simple, as you will see. You will flip the coin. The question you will answer is selected by chance. In no way can a truthful answer prove harmful to you. There is no identifying information that can link you to your answers.

Please take the coin that you have been handed and flip it now. Don't tell me which side came up. If the coin shows heads, please answer only question 1. If the coin shows tails, please answer only question 2. I won't look to see if the coin comes up heads or tails; and you don't tell me which question you are answering. Just tell me if your answer is "yes" or "no".

Yes.....1 19/
No.....2
Don't know.....8

A. Now let's do that again, using the next question. HAND B CARD Y. Flip the coin again. If the coin turns up heads, please answer only question 1. If the coin comes up tails, please answer only question 2. Don't tell me the question. Is your answer "yes" or "no"?

HAND
CARD
Y

Yes.....1 20/
No.....2
Don't know.....8

61. Have you ever been arrested for a felony?

Yes..... 21/
No.....(SKIP TO Q.64).....2

A. Have you ever been convicted of a felony?

Yes..... 22/
No.....(SKIP TO Q.64).....2

B. How many felonies have you been convicted of ?

ENTER NUMBER: 11

C. What month and year were you convicted of this/your first) felony?

11 11 11 11
Mo. Yr

D. (In what charge were you convicted?

29-30/

E. INTERVIEWER: HAS A EVER BEEN CONVICTED OF A SECOND FELONY? (IS A IN Q.66B EQUAL TO 2 OR MORE?)

Yes..... 31/
No.....(SKIP TO Q.64).....2

F. What month and year were you convicted of this/your first) felony?

11 11 11 11
Mo. Yr

G. (In what charge were you convicted?

36-37/

63. (Continued)

H. INTERVIEWER: HAS A EVER BEEN CONVICTED OF A THIRD FELONY? (IS A IN Q.66B EQUAL TO 3 OR MORE?)

Yes.....(GO TO NEW Q.68).....1 38/
No.....2

Next, I'd like some information about drinking alcoholic beverages.

64. Have you had any alcoholic beverages, including beer, wine, or liquor, since (DATE OF LAST INTERVIEW)?

Yes.....1 39/
No.....(SKIP TO SECTION 9).....2

65. Since (DATE OF LAST INTERVIEW) have you had a drink of beer?

Yes.....1 40/
No.....(SKIP TO Q.71).....2

66. How long has it been since your last drink of beer?

Today.....01 41-42/
1-7 days ago.....02
8-14 days ago.....03
15-30 days ago.....04
1 month ago.....05
2-3 months ago.....06
4-6 months ago.....07
7-12 months ago.....08
More than 1 year ago.....09

HAND CARD 2

67. As you think back over the period of time between (DATE OF LAST INTERVIEW) and now, about how many cans or bottles of beer would you drink on a typical day when you drank beer?

ENTER NUMBER OF CANS OR BOTTLES: 11 43-44/

68. Again, thinking back over the period of time between (DATE OF LAST INTERVIEW) and now, about how regularly did you drink beer? **PROBE IF NECESSARY: It's sometimes hard to remember. Just give me your best guess.**

More often than once a day.....01 45-46/
Every day.....02
5 or 6 days a week.....03
3 or 4 days a week.....04
1 or 2 days a week.....05
Less often than once a week.....06
IF CANNOT DECIDE/Don't know.....98

HAND
CARD
AA

69. How large were the cans or bottles that you usually drank?

Standard 12 oz. cans or bottles.....1 47/
16 oz. (half quart) cans or bottles.....2
32 oz. (full quart) cans or bottles.....3
Less than 12 oz. cans or bottles.....4
More than 32 oz. cans or bottles.....5
Don't drink cans or bottles of beer.....6

HAND
CARD
BB

70. During the last 12 months that you drank since (DATE OF LAST INTERVIEW), how often did you have 8 or more cans of beer in a single day (3 quarts or more)?

Every day or nearly every day.....01 48-49/
3-4 times a week.....02
Once or twice a week.....03
1-3 times a month.....04
7-11 times a year.....05
3-6 times a year.....06
Once or twice a year.....07
Never.....08

HAND
CARD
CC

71. Since (DATE OF LAST INTERVIEW) have you had a drink of wine?

Yes.....1 50/
No.....(SKIP TO Q.76).....2

72. How long has it been since your last drink of wine?

Today.....01 51-52/
1-7 days ago.....02
8-14 days ago.....03
15-30 days ago.....04
1 month ago.....05
2-3 months ago.....06
4-6 months ago.....07
7-12 months ago.....08
More than 1 year ago.....09

HAND
CARD
E

73. As you think back over the period of time between (DATE OF LAST INTERVIEW) and now, about how many glasses of wine would you drink on a typical day when you drank wine?

ENTER NUMBER OF GLASSES: | | | 53-54/

74. Again, thinking back over the period of time between (DATE OF LAST INTERVIEW) and now, about how regularly did you drink wine? **PROBE IF NECESSARY: It's sometimes hard to remember. Just give me your best guess.**

More often than once a day.....1 55/
Every day.....2
5 or 6 days a week.....3
3 or 4 days a week.....4
1 or 2 days a week.....5
Less often than once a week.....6
IF CANNOT DECIDE: Don't know.....8

HAND
CARD
AA

75. During the last 12 months that you drank since (DATE OF LAST INTERVIEW), how often did you have 8 or more glasses of wine in a single day (more than a fifth)?

Every day or nearly every day.....01 56-57/
 3-4 times a week.....02
 Once or twice a week.....03
 1-3 times a month.....04
 7-11 times a year.....05
 3-6 times a year.....06
 Once or twice a year.....07
 Never.....08

HAND
CARD
CC

76. Since (DATE OF LAST INTERVIEW) have you had a drink containing liquor, such as whiskey, vodka, gin, brandy, etc.?

Yes.....1 58/
 No...(SKIP TO Q.82).....2

77. How long has it been since your last drink of hard liquor?

Today.....01 59-60/
 1-7 days ago.....02
 8-14 days ago.....03
 15-30 days ago.....04
 1 month ago.....05
 2-3 months ago.....06
 4-6 months ago.....07
 7-12 months ago.....08
 More than 1 year ago.....09

HAND
CARD
2

78. As you think back over the period of time between (DATE OF LAST INTERVIEW) and now, about how many drinks of hard liquor would you drink on a typical day in which you drank hard liquor?

ENTER NUMBER OF DRINKS: 61-62/

79. Again, thinking back over the period of time between (DATE OF LAST INTERVIEW) and now, about how regularly did you drink hard liquor? PROBE IF NECESSARY: It's sometimes hard to remember. Just give me your best guess.

More often than once a day.....1 63/
 Every day.....2
 5 or 6 days a week.....3
 3 or 4 days a week.....4
 1 or 2 days a week.....5
 Less often than once a week.....6
 IF CANNOT DECIDE: Don't know.....8

HAND
CARD
AA

80. About how many ounces of hard liquor are there in the drinks that you usually drink?

One ounce (one shot).....1 64/
 1.5 ounces (one jigger).....2
 2 ounces (2 shots).....3
 3 ounces (2 jiggers or 3 shots).....4
 4 ounces (4 shots).....5
 5 or more ounces (3 or more jiggers).....6
 Don't know.....8

HAND
CARD
DD

81. During the last 12 months that you drank since (DATE OF LAST INTERVIEW), how often did you have 8 or more drinks of hard liquor in a single day (a half pint or more)?

Every day or nearly every day.....01 65-66/
 3-4 times a week.....02
 Once or twice a week.....03
 1-3 times a month.....04
 7-11 times a year.....05
 3-6 times a year.....06
 Once or twice a year.....07
 Never.....08

HAND
CARD
CC

82. Have you had a drink of beer, wine or hard liquor in the last 12 months?

Yes.....1 63/

No.....(SKIP TO SECTION 9).....2

83. About how often during the past 12 months did you drink enough to feel high -- that is, happier or more carefree than usual, maybe a little flushed or dizzy, but not drunk, for more than 24 hours in a row?

5 or more times.....01 68-69/

4 times.....02

3 times.....03

2 times.....04

Once.....05

Never in the past year, but sometime before that.....06

Never in my life.....07

NAME
(AND
RE

84. Now I would like to ask you some questions about experiences that many people have had with drinking. During the past year. . .

Yes No

- A. Have you felt aggressive or angry while drinking?.....1 2 70/
- B. Have you gotten into a heated argument while drinking?.....1 2 71/
- C. Have you gotten into a fight while drinking?.....1 2 72/
- D. Have you deliberately tried to cut down or quit drinking, but didn't manage to do so?.....1 2 73/
- E. Were you afraid you might be an alcoholic or that you might become one?.....1 2 74/
- F. Once you started drinking, was it difficult for you to stop before you became completely intoxicated?.....1 2 75/
- G. Have you awakened the next day not being able to remember things you had done while drinking?.....1 2 76/
- H. Have you often taken a drink the first thing when you got up in the morning?.....1 2 77/
- I. Have your hands shaken a lot the morning after drinking?.....1 2 78/
- J. Have you sometimes gotten drunk when drinking by yourself?.....1 2 79/
- K. Have you sometimes kept on drinking after promising yourself not to?.....1 2 80/

85. INTERVIEWER: HAS HE MISSED THE PAST YEAR?

YES...(ASK A THROUGH F).....1 10/

NO...(SKIP TO 0-86).....2

During the past year:

Yes No

A. Have you stayed away from work because of a hangover?.....1 2 11/

B. Have you gotten drunk when on the job?.....1 2 12/

C. Have you lost a job, or nearly lost one, because of drinking?.....1 2 13/

D. Has drinking led to your quitting a job?.....1 2 14/

E. Has drinking hurt your chances for promotion or release or a better job?.....1 2 15/

86. When you were growing up, do you think your father drank occasionally, drank frequently, had a drinking problem, or didn't he drink?

Drank occasionally.....1 16/

Drank frequently.....2

Had a drinking problem.....3

Didn't drink.....4

DON'T KNOW.....8

87. When you were growing up, do you think your mother drank occasionally, drank frequently, had a drinking problem, or didn't she drink?

Drank occasionally.....1 17/

Drank frequently.....2

Had a drinking problem.....3

Didn't drink.....4

DON'T KNOW.....8

SECTION 9: RECREATION, LEISURE, AND PHYSICAL ACTIVITIES

Now we would like you to answer some questions about your leisure time activities.

INTERVIEWER: HAND R SELF-ADMINISTERED FORM 3.

Listed below are a series of Leisure Time and Physical Activities. Related activities are grouped under general headings. 1) Please read the list and circle number 1 for each activity you have performed in the last 12 months, and circle number 2 for those you have not. 2) Check which months you performed these activities. 3) Record the average number of days per month you performed these activities, and 4) Record how many hours and minutes you performed these activities, on an average day.

1. Have you participated three or more times in (READ EACH ITEM)?

| | Yes | No |
|---|-----|-----|
| Scuba diving | 1 2 | 10/ |
| Auto, boat, or motorcycle racing | 1 2 | 19/ |
| Skydiving | 1 2 | 20/ |
| Mountain climbing | 1 2 | 21/ |
| Hang gliding | 1 2 | 22/ |
| Plane racing or plane acrobatics, not including flight training or any assignments for the Armed Forces | 1 2 | 23/ |
| Surf board riding | 1 2 | 24/ |
| Sailing long distance in small sailing craft | 1 2 | 25/ |
| Skiing fast down a high mountain slope | 1 2 | 26/ |

2. INTERVIEWER: HAS R ANSWERED "YES" TO ANY QUESTIONS ON SELF-ADMINISTERED FORM 3 AND TO Q.1 ABOVE?

YES.....1 27/
NO.....(SKIP TO SECTION 11).....2

SECTION 10: TOXIC SUBSTANCES

FOR EACH SUBSTANCE CIRCLE YES, AND A THROUGH D:

| | Have any of the recreation, leisure, and/or physical activities you've participated in since (DATE OF LAST INTERVIEW) brought you in contact with any of the following substances? | YES NO | MONTH | YEAR | MONTH | YEAR | Since (DATE OF LAST INTERVIEW), for how many years did you continue to come in contact with (SUBSTANCE)? |
|-----------------------------|--|--------|-------|------|-------|------|--|
| Asbestos? | 2 | 28/ | | | | | 11-34/ |
| Industrial chemicals? | 2 | 35/ | | | | | 40-41/ |
| Insecticides or pesticides? | 2 | 42/ | | | | | 47-48/ |
| Degreasing chemicals? | 2 | 49/ | | | | | 54-55/ |
| Defoliant or herbicides? | 2 | 56/ | | | | | 61-67 |
| X-ray or nuclear radiation? | 2 | 63/ | | | | | 68-69 |

1. (Continued)

C
Since (DATE OF LAST INTERVIEW), how many days per year did you come in contact with (SUBSTANTIVE)?

D
(In the days you came in contact with (SUBSTANTIVE) how often did you use protective clothing or gear or wash to remove (SUBSTANTIVE)?--all of the time, some of the time, or never?

E
Which of the following did you use?

NAME (CARD E)

CIRCLE ALL THAT APPLY.

| | | |
|---------------------------------|---|---|
| 70-72/ DAYS | 73/ All of the time.(ASK E)...1 Some of the time.(ASK E)...2 Never.....3 | air filter.....1 74/ goggles.....2 75/ face shield.....3 76/ special clothing.....4 77/ washing facilities.....5 78/ Self contained or supplied air breathing apparatus.....6 79/ None.....0 80/ |
| BEGIN DATE 57 10-12/ DAYS | 13/ All of the time.(ASK E)...1 Some of the time.(ASK E)...2 Never.....3 | air filter.....1 14/ goggles.....2 15/ face shield.....3 16/ special clothing.....4 17/ washing facilities.....5 18/ Self contained or supplied air breathing apparatus.....6 19/ None.....0 20/ |
| 21-23/ DAYS | 24/ All of the time.(ASK E)...1 Some of the time.(ASK E)...2 Never.....3 | air filter.....1 25/ goggles.....2 26/ face shield.....3 27/ special clothing.....4 28/ washing facilities.....5 29/ Self contained or supplied air breathing apparatus.....6 30/ None.....0 31/ |
| 32-34/ DAYS | 35/ All of the time.(ASK E)...1 Some of the time.(ASK E)...2 Never.....3 | air filter.....1 36/ goggles.....2 37/ face shield.....3 38/ special clothing.....4 39/ washing facilities.....5 40/ Self contained or supplied air breathing apparatus.....6 41/ None.....0 42/ |
| 43-45/ DAYS | 46/ All of the time.(ASK E)...1 Some of the time.(ASK E)...2 Never.....3 | air filter.....1 47/ goggles.....2 48/ face shield.....3 49/ special clothing.....4 50/ washing facilities.....5 51/ Self contained or supplied air breathing apparatus.....6 52/ None.....0 53/ |
| 54-56/ DAYS | 57/ All of the time.(ASK E)...1 Some of the time.(ASK E)...2 Never.....3 | air filter.....1 58/ goggles.....2 59/ face shield.....3 60/ special clothing.....4 61/ washing facilities.....5 62/ Self contained or supplied air breathing apparatus.....6 63/ None.....0 64/ |

INTERVIEWER: NAME & SELF-ADMINISTERED FORM 4
AND GENERAL PURPOSE ANSWER SHEET

The Jenkins Activity Survey asks questions about aspects of behavior that have been found helpful in medical diagnosis. Each person is different, so there are no "right" or "wrong" answers.

For each question, choose the answer that is true for you. In your answer sheet, fill in the circle below the letter of your answer. Use a black lead pencil, and make your marks heavy and dark. Mark only one answer for each question. If you change your mind, erase the old mark completely.

SECTION 11. INCOME

Now I have some questions about your income.

1. Please tell me which letter on this card best represents the total household income in 1984 before taxes or other deductions for all people in your household, not including income. This amount should include wages, net income from business, interest, dividends, pensions, and any other money income. Tell me the letter that comes closest.

- A. \$5,000 - \$9,999.....01
- B. \$10,000 - \$14,999.....02
- C. \$15,000 - \$19,999.....03
- D. \$20,000 - \$24,999.....04
- E. \$25,000 - \$29,999.....05
- F. \$30,000 - \$34,999.....06
- G. \$35,000 - \$39,999.....07
- H. \$40,000 - \$44,999.....08
- I. \$45,000 - \$49,999.....09
- J. \$50,000 - \$54,999.....10
- K. \$55,000 - \$59,999.....11
- L. \$60,000 - \$64,999.....12
- M. \$65,000 - \$69,999.....13
- N. \$70,000 - \$74,999.....14
- O. \$75,000 - \$79,999.....15
- P. \$80,000 - \$84,999.....16
- Q. \$85,000 - \$89,999.....17
- R. \$90,000 - \$94,999.....18
- S. \$95,000 - \$99,999.....19
- T. \$100,000 or more.....20

HARD
CARD
FF

2. Did you earn any income from any job during 1984? Do not include income from retirement plans or pensions.

Yes.....(ASK A).....1

No.....(SKIP TO Q.3).....2

A. In which of these groups did your earnings from jobs in 1984 fall - that is, before taxes or other deductions? Tell me the letter that comes closest.

- A. \$5,000 - \$9,999.....01
- B. \$10,000 - \$14,999.....02
- C. \$15,000 - \$19,999.....03
- D. \$20,000 - \$24,999.....04
- E. \$25,000 - \$29,999.....05
- F. \$30,000 - \$34,999.....06
- G. \$35,000 - \$39,999.....07
- H. \$40,000 - \$44,999.....08
- I. \$45,000 - \$49,999.....09
- J. \$50,000 - \$54,999.....10
- K. \$55,000 - \$59,999.....11
- L. \$60,000 - \$64,999.....12
- M. \$65,000 - \$69,999.....13
- N. \$70,000 - \$74,999.....14
- O. \$75,000 - \$79,999.....15
- P. \$80,000 - \$84,999.....16
- Q. \$85,000 - \$89,999.....17
- R. \$90,000 - \$94,999.....18
- S. \$95,000 - \$99,999.....19
- T. \$100,000 or more.....20

HARD
CARD
FF

3. INTERVIEWER:

RECORD
TIME
FNUH

INTERVIEWER REMARKS

INTERVIEWER: Please complete these remarks as soon as you have finished the questionnaire.

1. Length of the interview: _____
(Section 1, p.1 through Section 12) _____ MINUTES _____ 75-77/

2. Date of the interview: _____
MONTH DAY YEAR _____ 10-15/

3. Race of Respondent: _____
White.....1 16/
Black.....2
Other.....3

4. In general, what was the respondent's attitude toward the interview?
Friendly and interested.....1 17/
Cooperative but not particularly interested.....2
Impatient and restless.....3
Hostile.....4

5. In general, was the respondent's understanding of the questions....
Good?.....1 18/
Fair?.....2
Poor?.....3

6. List the question that confused, angered, or caused discomfort to the respondent or questions that you feel the respondent did not answer truthfully. EXPLAIN.

NAME.....0 19/
SECTION QUESTION
A. 20-21/ 22-24/
B. 25-26/ 27-29/
C. 30-31/ 32-34/
Describe Problem: _____ 35/

7. List questions with skip errors, questions that were confusing to you, or questions that otherwise didn't work. EXPLAIN

NAME.....0 36/
SECTION QUESTION
A. 37-38/ 39-41/
B. 42-43/ 44-46/
C. 47-48/ 49-51/
Describe Problem: _____ 52/

8. Please record your Interviewer ID #: _____ 53-58/

9. Please sign your name: _____

MURC
 4428
 5/65

AIR FORCE HEALTH SURVEY
 TRANSMITTAL FORM

Complete this form and enclose a copy with each case mailed to Chicago

| | | |
|--------------|--------------|----------------|
| Int. ID # | Int. Name | Date Mailed |
|--------------|--------------|----------------|

QUANTITY
 REQUIRED If not enclosed, explain


| | |
|---|-------|
| Information Sheet | _____ |
| Children's Record Form | _____ |
| Supplementary Children's Record Form | _____ |
| Questionnaire | _____ |
| Self-Administered Form 1 | _____ |
| Self-Administered Form 2 | _____ |
| Self-Administered Form 3 | _____ |
| Medical Consent Form | _____ |

| | | | |
|-----------------------------|-------|-------------------------------|------------|
| Date received in Chicago | _____ | FOR OFFICE USE ONLY | CIRCLE ONE |
| | | All required forms present | Yes No |

APPENDIX C*

Physical Examination Methodology

*Original forms were color coded; limited photocopy quality.

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--------------|----------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|---|---|
| CASE NUMBER | NAME: | GROUP # |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DATE OF BIRTH: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>0</td> </tr> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>0</td> </tr> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>0</td> </tr> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>0</td> </tr> </table> | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |
| 1 | 2 | 3 | | 4 | 5 | 6 | 7 | 8 | 9 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>NO</td><td>JAN</td><td>FEB</td><td>MAR</td><td>APR</td><td>MAY</td><td>JUN</td><td>JUL</td><td>AUG</td><td>SEP</td><td>OCT</td><td>NOV</td><td>DEC</td> </tr> <tr> <td>DAY</td><td>30</td><td>20</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td> </tr> <tr> <td>YR</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td><td>40</td><td>41</td><td>42</td><td>43</td><td>44</td><td>45</td><td>46</td> </tr> </table> | | | NO | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | DAY | 30 | 20 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | YR | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | | |
| NO | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DAY | 30 | 20 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| YR | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FORM AFHS-1 | | HISTORY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

VERSION 10 JRW SCF 585

FAMILY HISTORY — PLEASE BLACKEN THE CIRCLE FOR ANY FAMILY MEMBER THAT HAS HAD ANY OF THE FOLLOWING.

| REVIEWER'S COMMENTS | BLOOD RELATIVES → | NONE | MOTHER | FATHER | SISTER | BROTHER | CHILD |
|---------------------|---------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | DIABETES | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| | EPILEPSY | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| | CANCER | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| | HIGH BLOOD PRESSURE | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| | HEART DISEASE | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| | STROKE | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| | ALLERGY | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| | STOMACH TROUBLE | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| | NERVOUS TROUBLE | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| | BLOOD DISEASE | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| | DEFORMITIES | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| | ARTHRITIS | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| | OTHER FAMILIAL DIS. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

→ PLEASE LIST HERE.

CURRENT FAMILY STATUS

| | | | | | |
|----------|------------|----------|----------------------|--|-----------------|
| FATHER: | LIVING-AGE | DEAD-AGE | CONDITION OF HEALTH? | <input type="radio"/> EXCELLENT <input type="radio"/> GOOD <input type="radio"/> FAIR <input type="radio"/> POOR | CAUSE OF DEATH? |
| MOTHER: | LIVING-AGE | DEAD-AGE | CONDITION OF HEALTH? | <input type="radio"/> EXCELLENT <input type="radio"/> GOOD <input type="radio"/> FAIR <input type="radio"/> POOR | CAUSE OF DEATH? |
| BROTHERS | LIVING | DEAD | AGES | | |
| NUMBER | | | CAUSES | | |
| SISTERS | LIVING | DEAD | AGES | | |
| NUMBER | | | CAUSES | | |

ARE YOU MARRIED? ☐ NO OF YEARS WIFE'S AGE

HEALTH OF WIFE? ☐ EXCELLENT ☐ GOOD ☐ FAIR ☐ POOR

IF WIFE IS DEAD PLEASE GIVE AGE, YEAR AND CAUSE OF DEATH

CHILDREN: BOYS' AGES GIRLS' AGES ALL HEALTHY? ☐ ANY DEAD? ☐ ANY BIRTH DEFECTS? ☐

| | |
|--|--|
| DO YOU HAVE ANY PHYSICAL OR NERVOUS COMPLAINTS? | DO YOU HAVE ANY ALLERGIES OR SEVERE REACTIONS TO MEDICINES, FOODS, PLANTS, CHEMICALS, ETC? |
| YES <input type="checkbox"/> NO <input type="checkbox"/> EXPLAIN | YES <input type="checkbox"/> NO <input type="checkbox"/> |
| PLEASE DESCRIBE | |

PERSONAL HISTORY

| YES | NO | YES | NO | YES | NO |
|---|---|---|---|-----------------------------|----|
| <input checked="" type="radio"/> <input type="radio"/> SKIN TROUBLE | <input checked="" type="radio"/> <input type="radio"/> HEPATITIS | <input checked="" type="radio"/> <input type="radio"/> ARTHRITIS | <p>← BLACKEN THE <input type="radio"/> CIRCLE NEXT TO ANY OF THESE CONDITIONS THAT YOU NOW HAVE OR HAVE HAD IN THE PAST. OTHERWISE BLACKEN <input type="radio"/>.</p> | <p>REVIEWER'S COMMENTS.</p> | |
| <input checked="" type="radio"/> <input type="radio"/> ACNE | <input checked="" type="radio"/> <input type="radio"/> WORMS | <input checked="" type="radio"/> <input type="radio"/> SCLERODERMA | | | |
| <input checked="" type="radio"/> <input type="radio"/> EXCESS HAIR GROWTH | <input checked="" type="radio"/> <input type="radio"/> COLITIS | <input checked="" type="radio"/> <input type="radio"/> RHEUMATIC FEVER | | | |
| <input checked="" type="radio"/> <input type="radio"/> OTHER SKIN TROUBLE | <input checked="" type="radio"/> <input type="radio"/> HEMORRHOIDS | <input checked="" type="radio"/> <input type="radio"/> CANCER OR TUMOR | | | |
| | <input checked="" type="radio"/> <input type="radio"/> KIDNEY STONES | <input checked="" type="radio"/> <input type="radio"/> VARICOSE VEINS | | | |
| | <input checked="" type="radio"/> <input type="radio"/> KIDNEY TROUBLE | <input checked="" type="radio"/> <input type="radio"/> PHLEBITIS | | | |
| | <input checked="" type="radio"/> <input type="radio"/> BLADDER TROUBLE | <input checked="" type="radio"/> <input type="radio"/> HERNIA (RUPTURE) | | | |
| | <input checked="" type="radio"/> <input type="radio"/> PROSTATE TROUBLE | <input checked="" type="radio"/> <input type="radio"/> ANEMIA | | | |
| <input checked="" type="radio"/> <input type="radio"/> CATARACTS | <input checked="" type="radio"/> <input type="radio"/> SYPHILIS | <input checked="" type="radio"/> <input type="radio"/> POLIO | | | |
| <input checked="" type="radio"/> <input type="radio"/> TONSILLITIS | <input checked="" type="radio"/> <input type="radio"/> GONORRHEA | <input checked="" type="radio"/> <input type="radio"/> MUMPS | | | |
| <input checked="" type="radio"/> <input type="radio"/> SINUSITIS | <input checked="" type="radio"/> <input type="radio"/> FAINTING | <input checked="" type="radio"/> <input type="radio"/> MALARIA | | | |
| <input checked="" type="radio"/> <input type="radio"/> GOITER | <input checked="" type="radio"/> <input type="radio"/> FITS OR CONVULSIONS | <input checked="" type="radio"/> <input type="radio"/> GOUT | | | |
| <input checked="" type="radio"/> <input type="radio"/> HAY FEVER | <input checked="" type="radio"/> <input type="radio"/> DEPRESSION | <input checked="" type="radio"/> <input type="radio"/> DIABETES | | | |
| <input checked="" type="radio"/> <input type="radio"/> ASTHMA | <input checked="" type="radio"/> <input type="radio"/> NERVOUS BREAKDOWN | <input checked="" type="radio"/> <input type="radio"/> MEASLES | | | |
| <input checked="" type="radio"/> <input type="radio"/> BRONCHITIS | <input checked="" type="radio"/> <input type="radio"/> PARALYSIS | <input checked="" type="radio"/> <input type="radio"/> DYSENTERY | | | |
| <input checked="" type="radio"/> <input type="radio"/> PLEURISY | <input checked="" type="radio"/> <input type="radio"/> MUSCLE PAIN | | | | |
| <input checked="" type="radio"/> <input type="radio"/> PNEUMONIA | <input checked="" type="radio"/> <input type="radio"/> MUSCLE WEAKNESS | | | | |
| <input checked="" type="radio"/> <input type="radio"/> TUBERCULOSIS | <input checked="" type="radio"/> <input type="radio"/> NUMBNESS | | | | |
| <input checked="" type="radio"/> <input type="radio"/> HEART TROUBLE | <input checked="" type="radio"/> <input type="radio"/> LOSS OF SENSATION | | | | |
| <input checked="" type="radio"/> <input type="radio"/> STOMACH TROUBLE | <input checked="" type="radio"/> <input type="radio"/> LOSS OF SEX DRIVE | | | | |
| <input checked="" type="radio"/> <input type="radio"/> ULCERS | <input checked="" type="radio"/> <input type="radio"/> RHEUMATOID ARTHRITIS | | | | |
| <input checked="" type="radio"/> <input type="radio"/> GALLSTONES | <input checked="" type="radio"/> <input type="radio"/> SEVERE ARTHRITIS | | | | |
| <input checked="" type="radio"/> <input type="radio"/> JAUNDICE | <input checked="" type="radio"/> <input type="radio"/> SYSTEMIC LUPUS | | | | |
| <input checked="" type="radio"/> <input type="radio"/> LIVER TROUBLE | <input checked="" type="radio"/> <input type="radio"/> ERYTHEMATOSIS | | | | |

LIST THE AVERAGE FOR EACH OF THE FOLLOWING DURING THE LAST 90 DAYS.

| | PER DAY |
|---|--|
| <input type="text"/> HOURS WORKED PER DAY | <input type="text"/> NUMBER CIGARETTES |
| <input type="text"/> HOURS SLEEP PER NIGHT | <input type="text"/> ALCOHOLIC DRINKS |
| <input type="text"/> DAYS WORKED PER WEEK | <input type="text"/> CUPS COFFEE |
| <input type="text"/> DAYS VACATION PER YEAR | <input type="text"/> CHEWING TOBACCO |
| | <input type="text"/> SNUFF |

FOR THE PAST 90 DAYS OR MORE.

| | | |
|--|----------------------|-----|
| DID YOU TAKE REGULAR EXERCISE? | <input type="text"/> | LBS |
| WHAT IS YOUR USUAL WEIGHT? | <input type="text"/> | LBS |
| WHAT IS THE MOST YOU EVER WEIGHED? | <input type="text"/> | LBS |
| AT WHAT AGE? | <input type="text"/> | |
| HAVE YOU RECENTLY LOST OR GAINED WEIGHT? | <input type="text"/> | |
| IF SO, HOW MUCH? (+/-) | <input type="text"/> | LBS |

PAST HISTORY

PLEASE LIST PREVIOUS OPERATIONS, INJURIES, AND SERIOUS ILLNESSES, INCLUDING THOSE INDICATED ABOVE

| YEAR | DESCRIPTION OF OPERATION, INJURY, OR SERIOUS ILLNESS |
|---------------------------|--|
| <input type="text"/> | <input type="text"/> |
| <input type="text"/> | <input type="text"/> |
| <input type="text"/> | <input type="text"/> |
| DO NOT MARK IN THIS SPACE | |
| <input type="text"/> | <input type="text"/> |
| <input type="text"/> | <input type="text"/> |

PLEASE BLACKEN THE CIRCLE IF YOU HAVE HAD REPEATED CASES OF ANY OF THE FOLLOWING IN THE PAST YEAR.

| YES | NO |
|--|---|
| <input checked="" type="radio"/> <input type="radio"/> | <input type="radio"/> <input type="radio"/> |
| <input checked="" type="radio"/> <input type="radio"/> | <input type="radio"/> <input type="radio"/> |
| <input checked="" type="radio"/> <input type="radio"/> | <input type="radio"/> <input type="radio"/> |
| <input checked="" type="radio"/> <input type="radio"/> | <input type="radio"/> <input type="radio"/> |

SPECIFY

WHEN WAS YOUR LAST PHYSICAL EXAM?

ANY ABNORMALITY FOUND?

ARE YOU UNDER ANY MEDICAL TREATMENT NOW?

DID YOU TAKE ANY MEDICATIONS OR TREATMENT NOW OR OCCASIONALLY?


YES NO PLEASE DESCRIBE

YOUR PERSONAL PHYSICIAN

NAME

STREET ADDRESS

CITY STATE & ZIP

| | | | |
|---|-------------------------------|---------------------|---|
| CASE NUMBER | | NAME OF PARTICIPANT |  |
| <input type="text"/> | <input type="text"/> B | | |
| PAGE <input type="text"/> OF <input type="text"/> | | FORM AFHS-2B | EXPOSURE HISTORY DETAILS |

FOR EACH YES EXPOSURE AT THE END OF FORM AFHS-2A PLEASE FILL OUT ONE OF THE FOLLOWING BLOCKS
USE ADDITIONAL SHEETS IF NECESSARY

| | | | | | | | | |
|---|--|-------|--------|---------|--------------------------------------|--------------------------------------|-----|----|
| TYPE OF EXPOSURE COAL TAR ETC | | | | | WAS EXPOSURE RECEIVED ON THE JOB? | | YES | NO |
| IF ON THE JOB EXPOSURE JOB TITLE | | | | | | | | |
| IF NOT ON THE JOB EXPOSURE HOW EXPOSURE RECEIVED | | | | | | | | |
| | | | | | | | | |
| CHECK FREQUENCY OF EXPOSURE THAT BEST FITS YOUR EXPERIENCE | | DAILY | WEEKLY | MONTHLY | YEARLY | IN WHAT YEAR(S) WERE YOU EXPOSED? | | |

| | | | | | | | | |
|---|--|-------|--------|---------|--------------------------------------|--------------------------------------|-----|----|
| TYPE OF EXPOSURE COAL TAR ETC | | | | | WAS EXPOSURE RECEIVED ON THE JOB? | | YES | NO |
| IF ON THE JOB EXPOSURE JOB TITLE | | | | | | | | |
| IF NOT ON THE JOB EXPOSURE HOW EXPOSURE RECEIVED | | | | | | | | |
| | | | | | | | | |
| CHECK FREQUENCY OF EXPOSURE THAT BEST FITS YOUR EXPERIENCE | | DAILY | WEEKLY | MONTHLY | YEARLY | IN WHAT YEAR(S) WERE YOU EXPOSED? | | |

| | | | | | | | | |
|---|--|-------|--------|---------|--------------------------------------|--------------------------------------|-----|----|
| TYPE OF EXPOSURE COAL TAR ETC | | | | | WAS EXPOSURE RECEIVED ON THE JOB? | | YES | NO |
| IF ON THE JOB EXPOSURE JOB TITLE | | | | | | | | |
| IF NOT ON THE JOB EXPOSURE HOW EXPOSURE RECEIVED | | | | | | | | |
| | | | | | | | | |
| CHECK FREQUENCY OF EXPOSURE THAT BEST FITS YOUR EXPERIENCE | | DAILY | WEEKLY | MONTHLY | YEARLY | IN WHAT YEAR(S) WERE YOU EXPOSED? | | |

| | | | | | | | | |
|---|--|-------|--------|---------|--------------------------------------|--------------------------------------|-----|----|
| TYPE OF EXPOSURE COAL TAR ETC | | | | | WAS EXPOSURE RECEIVED ON THE JOB? | | YES | NO |
| IF ON THE JOB EXPOSURE JOB TITLE | | | | | | | | |
| IF NOT ON THE JOB EXPOSURE HOW EXPOSURE RECEIVED | | | | | | | | |
| | | | | | | | | |
| CHECK FREQUENCY OF EXPOSURE THAT BEST FITS YOUR EXPERIENCE | | DAILY | WEEKLY | MONTHLY | YEARLY | IN WHAT YEAR(S) WERE YOU EXPOSED? | | |

| | | | | | |
|---|--|--|--|----------------|--|
| CASE NUMBER | | NAME: | | GROUP # | |
| | | DATE OF BIRTH: | | | |
| 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 | | TODAY'S DATE MO JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC DAY 30 20 10 3 3 7 5 5 4 3 2 1 YR 35 36 37 38 39 90 91 92 93 94 95 96 | | | |
| | | FORM AFHS-3A | | | |
| | | PHYSICAL EXAMINATION | | | |



VERSION 10 JRW SCF 585

GENERAL APPEARANCE

| | APPEARANCE VS STATED AGE | APPEARANCE OF ILLNESS OR DISTRESS | HAIR DISTRIBUTION |
|-----------------|--------------------------|-----------------------------------|-------------------|
| WELL NOURISHED | YOUNGER THAN | YES | NORMAL |
| OBESE | OLDER THAN | | |
| UNDER-NOURISHED | SAME AS | NO | ABNORMAL |

Y N COMMENT

DESCRIBE ANY ABNORMAL HAIR DISTRIBUTION:

NOTE: FILL IN VITAL SIGNS WITH "0"s IF REFUSED.

VITAL SIGNS

| HEIGHT CM | WEIGHT (UNDRESSED) KG | TEMPERATURE ORAL °F | SITTING BLOOD PRESSURE NONDOMINANT ARM, HEART LEVEL | | PULSE RATE | VPBs PER MINUTE | PULSE IS: REGULAR IRREGULAR IRREGULARLY IRREGULAR |
|--------------|-----------------------------|---------------------------|--|-----------|---------------|-----------------------|--|
| | | | SYSTOLIC | DIASTOLIC | | | |
| 0 0 0 | 50 0 0 | 97 0 0 | 0 0 0 | 0 0 0 | 0 0 0 | 0 0 | DESCRIBE ANY IRREGULARITIES: Y N COMMENT |
| 1 1 1 | 60 1 1 | 98 1 1 | 1 1 1 | 1 1 1 | 1 1 1 | 1 1 | |
| 2 2 2 | 70 2 2 | 99 2 2 | 2 2 2 | 2 2 | 2 2 2 | 2 2 | |
| 3 3 3 | 80 3 3 | 100 3 3 | 3 3 | 3 3 | 3 3 3 | 3 3 | |
| 4 4 4 | 90 4 4 | 101 4 4 | 4 4 | 4 4 | 4 4 | 4 4 | |
| 5 5 5 | 100 5 5 | 102 5 5 | 5 5 | 5 5 | 5 5 | 5 5 | |
| 6 6 6 | 110 6 6 | 103 6 6 | 6 6 | 6 6 | 6 6 | 6 6 | |
| 7 7 7 | 120 7 7 | 104 7 7 | 7 7 | 7 7 | 7 7 | 7 7 | |
| 8 8 8 | 8 8 | 8 8 | 8 8 | 8 8 | 8 8 | 8 8 | |
| 9 9 9 | 9 9 | 9 9 | 9 9 | 9 9 | 9 9 | 9 9 | |

EYES

| | FUNDUSCOPIC | | | | EXTERNAL | |
|----------|-------------|----|-----|----|----------|----|
| | YES | NO | YES | NO | YES | NO |
| NORMAL | Y | N | Y | N | Y | N |
| ABNORMAL | | Y | Y | N | | Y |
| | | N | Y | N | | N |
| REFUSED | | Y | Y | N | | Y |
| | | N | Y | N | | N |

IF SIGNS - HEMORRHAGES EXUDATES, OR PAPILLEDEMA

Y N COMMENT

ENT

☐ NORMAL
☐ ABNORMAL
☐ REFUSED

YES NO
 ✓ ☐ RIGHT TYMPANIC MEMBRANE INTACT
 ✓ ☐ LEFT TYMPANIC MEMBRANE INTACT
 ✓ ☐ NASAL ULCERATIONS

☐ COMMENT

DESCRIBE ABNORMALITY

NECK

☐ NORMAL
☐ ABNORMAL
☐ REFUSED

THYROID GLAND
 PALPABLE NODULES
 ENLARGED TENDERNESS

LEFT RIGHT
 PAROTID GLAND ENLARGEMENT
 CAROTID PULSE ABSENT
 CAROTID BRUIT PRESENT

☐ COMMENT

DESCRIBE ABNORMALITY

THORAX AND LUNGS

☐ NORMAL
☐ ABNORMAL
☐ REFUSED

YES NO
 ✓ ☐ ASYMMETRICAL EXPANSION
 ✓ ☐ HYPERRESONANCE
 ✓ ☐ DULLNESS
 ✓ ☐ WHEEZES
 ✓ ☐ RALES NOTE LOCATION
 IN BOX BELOW

CHEST CIRCUMFERENCE (CM)
 AT NIPPLE LEVEL

| EXPIRATION | | INSPIRATION | |
|------------|---|-------------|---|
| | | | |
| 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 1 |
| 2 | 2 | 2 | 2 |
| 3 | 3 | 3 | 3 |
| 4 | 4 | 4 | 4 |
| 5 | 5 | 5 | 5 |
| 6 | 6 | 6 | 6 |
| 7 | 7 | 7 | 7 |
| 8 | 8 | 8 | 8 |
| 9 | 9 | 9 | 9 |

DESCRIBE ABNORMALITY:

☐ COMMENT

HEART

☐ NORMAL
☐ ABNORMAL
☐ REFUSED


HEART SOUNDS NORMAL
 DISPLACEMENT OF APICAL IMPULSE
 PRECORDIAL THRUST

YES NO
 ✓ ☐ ☐

ABNORMAL HEART SOUND(S)
 NO S1 S2 S3 S4
 YES Y Y Y Y

MURMUR
 NO SYSTOLIC AORTIC PULMONIC APEX MITRAL
 YES DIASTOLIC Y Y Y Y COMMENT

DESCRIBE ANY ENLARGEMENT, IRREGULARITY OF RATE, MURMUR, OR THRILL.

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|---|
| CASE NUMBER | | | | | | | | | | NAME: | | | | | | | | | | GROUP # | | | | | | | | | |  |
| | | | | | | | | | | DATE OF BIRTH: | | | | | | | | | | | | | | | | | | | | |
| 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 | | | | | | | | | | TODAY'S DATE MO DAY YR JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC 30 20 10 9 8 7 6 5 4 3 2 1 35 36 37 38 39 90 91 92 93 94 95 96 | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | FORM AFHS-3B | | | | | | | | | | PHYSICAL EXAMINATION (CONTINUED) | | | | | | | | | | |

VERSION 10 JRW SCF 585

ABDOMEN

| | | | | | | | | | | | |
|---|---|---|--------------------------|--|-------------|----------------------------|--|--|---------------------|--|--|
| <input type="radio"/> NORMAL <input type="radio"/> ABNORMAL <input type="radio"/> REFUSED | YES NO <input type="radio"/> <input type="radio"/> HEPATOMEGALY <input type="radio"/> <input type="radio"/> SPLENOMEGALY <input type="radio"/> <input type="radio"/> TENDERNESS LIVER <input type="radio"/> <input type="radio"/> TENDERNESS SPLEEN <input type="radio"/> <input type="radio"/> OTHER TENDERNESS <input type="radio"/> <input type="radio"/> OTHER MASS | CM <table border="1"> <tr> <td colspan="2">WAIST MEASUREMENT</td> <td>100 200 300</td> </tr> <tr> <td>10 20 30 40 50 60 70 80 90</td> <td></td> <td></td> </tr> <tr> <td>0 1 2 3 4 5 6 7 8 9</td> <td></td> <td></td> </tr> </table> | WAIST MEASUREMENT | | 100 200 300 | 10 20 30 40 50 60 70 80 90 | | | 0 1 2 3 4 5 6 7 8 9 | | |
| | WAIST MEASUREMENT | | 100 200 300 | | | | | | | | |
| 10 20 30 40 50 60 70 80 90 | | | | | | | | | | | |
| 0 1 2 3 4 5 6 7 8 9 | | | | | | | | | | | |
| | | <table border="1"> <tr> <td colspan="2">LIVER SPAN</td> <td>10 20 30</td> </tr> <tr> <td>0 1 2 3 4 5 6 7 8 9</td> <td></td> <td></td> </tr> </table> | LIVER SPAN | | 10 20 30 | 0 1 2 3 4 5 6 7 8 9 | | | | | |
| LIVER SPAN | | 10 20 30 | | | | | | | | | |
| 0 1 2 3 4 5 6 7 8 9 | | | | | | | | | | | |

DESCRIBE ABNORMALITY:

EXTREMITIES

| | | |
|---|--|--|
| <input type="radio"/> NORMAL <input type="radio"/> ABNORMAL <input type="radio"/> REFUSED | YES NO <input type="radio"/> <input type="radio"/> PITTING EDEMA <input type="radio"/> <input type="radio"/> NON-PITTING EDEMA <input type="radio"/> <input type="radio"/> ABSENCE (SPECIFY IN BOX BELOW) | YES NO <input type="radio"/> <input type="radio"/> CLUBBING OF NAILS <input type="radio"/> <input type="radio"/> VARICOSITIES <input type="radio"/> <input type="radio"/> LOSS OF HAIR ON TOES RIGHT <input type="radio"/> <input type="radio"/> LOSS OF HAIR ON TOES LEFT |
| | | |

DESCRIBE EDEMA, SIGNS OF VASCULAR INSUFFICIENCY, OR ABSENCE OF PART OR ALL OF EXTREMITY:

PERIPHERAL PULSES

| | NORMAL | DIMINISHED | ABSENT | REFUSED |
|------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| RADIAL | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| FEMORAL | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| POPLITEAL | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| DORSALIS PEDIS | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| POSTERIOR TIBIAL | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

COMMENTS: ☐ ☐

MUSCULOSKELETAL

- ☐ NORMAL
- ☐ ABNORMAL
- ☐ REFUSED

STRAIGHT LEG RAISING

- ☐ NORMAL
- ☐ ABNORMAL

☐ ☐ COMMENT

MUSCLES

PRESENT ABSENT

- | | | |
|-----------------------|-----------------------|-------------------------|
| <input type="radio"/> | <input type="radio"/> | WEAKNESS |
| <input type="radio"/> | <input type="radio"/> | TENDERNESS |
| <input type="radio"/> | <input type="radio"/> | ATROPHY |
| <input type="radio"/> | <input type="radio"/> | ABNORMAL CONSISTENCY |

SPINE

PRESENT ABSENT

- | | | |
|-----------------------|-----------------------|------------------------------|
| <input type="radio"/> | <input type="radio"/> | SCOLIOSIS |
| <input type="radio"/> | <input type="radio"/> | KYPHOSIS |
| <input type="radio"/> | <input type="radio"/> | PELVIC TILT |
| <input type="radio"/> | <input type="radio"/> | DECREASED RANGE OF MOTION |
| <input type="radio"/> | <input type="radio"/> | TENDERNESS |

**TENDERNESS
LEVEL**

☐ CERVICAL ☐ THORACIC ☐ LUMBAR ☐ SACRAL

COMMENTS:

GENITOURINARY/RECTAL/HERNIA

☐ NORMAL

☐ ABNORMAL

☐ REFUSED

☐ ☐ COMMENT

YES NO

- ☐ ☐ RT INGUINAL HERNIA
- ☐ ☐ LT INGUINAL HERNIA
- ☐ ☐ VARICOCELE
- ☐ ☐ HEMORRHOIDS

YES NO

- ☐ ☐ PROSTATIC ENLARGEMENT
- ☐ ☐ EPIDIDYMIS
- ☐ ☐ RECTAL MASS
- ☐ ☐ SCROTAL MASS
- 0 1 2 3 4 5 6 7 8 9
(DIAMETER-CM)

TESTES

| | | | | |
|-------|-----------------------|-----------------------|-----------------------|-----------------------|
| | NORM. | ABS. | ENGL. | ATROPH. |
| LEFT | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| RIGHT | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

COMMENTS:

LYMPH NODES

☐ NORMAL

☐ ABNORMAL

☐ REFUSED

| | | | | | | |
|-----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | NON PALPABLE | ENLARGED | TENDER | HARD | FIXED | CONFLUENT |
| CERVICAL | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| OCCIPITAL | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| SUPRACLAVICULAR | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| AXILLARY | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| EPITROCHLEAR | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| INGUINAL | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| FEMORAL | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

OTHER TESTS ORDERED

☐ YES

☐ NO

DESCRIBE:

☐ ☐ COMMENT

PRINTED NAME OF EXAMINING PHYSICIAN

SIGNATURE

CASE NUMBER

NAME

GROUP

DATE OF BIRTH:



TODAY'S DATE

| MO | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| DAY | 30 | 29 | 31 | 30 | 31 | 30 | 31 | 31 | 30 | 31 | 30 | 31 |
| YR | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 |

FORM AFHS-4

DERMATOLOGIC EXAMINATION AND BIOPSY

VERSION 10, REV SEP 88

SKIN

BLACKEN CIRCLE IF LESION IS OBSERVED

REFUSED EXAMINATION

INDICATE TYPE AND LOCATION OF LESION ON ATTACHED ANATOMICAL CHART

| YES | NO | | YES | NO | |
|--------------------------|--------------------------|--------------------|--------------------------|--------------------------|-----------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | COMEDONES | <input type="checkbox"/> | <input type="checkbox"/> | PALMAR KERATOSES |
| <input type="checkbox"/> | <input type="checkbox"/> | ACNEFORM LESIONS | <input type="checkbox"/> | <input type="checkbox"/> | ACTINIC KERATOSES |
| <input type="checkbox"/> | <input type="checkbox"/> | ACNEFORM SCARS | <input type="checkbox"/> | <input type="checkbox"/> | PETECHIAE |
| <input type="checkbox"/> | <input type="checkbox"/> | DEPIGMENTATION | <input type="checkbox"/> | <input type="checkbox"/> | ECCHYMOSES |
| <input type="checkbox"/> | <input type="checkbox"/> | INCLUSION CYSTS | <input type="checkbox"/> | <input type="checkbox"/> | CONJUNCTIVAL ABNORMALITY |
| <input type="checkbox"/> | <input type="checkbox"/> | CUTIS RHOMBOIDALIS | <input type="checkbox"/> | <input type="checkbox"/> | ORAL MUCOSAL ABNORMALITY |
| <input type="checkbox"/> | <input type="checkbox"/> | HYPERPIGMENTATION | <input type="checkbox"/> | <input type="checkbox"/> | FINGER NAIL ABNORMALITY |
| <input type="checkbox"/> | <input type="checkbox"/> | JAUNDICE | <input type="checkbox"/> | <input type="checkbox"/> | TOE NAIL ABNORMALITY |
| <input type="checkbox"/> | <input type="checkbox"/> | SPIDER ANGIOMATA | <input type="checkbox"/> | <input type="checkbox"/> | DERMATOGRAPHIA |
| <input type="checkbox"/> | <input type="checkbox"/> | PALMAR ERYTHEMA | <input type="checkbox"/> | <input type="checkbox"/> | SUSPECTED BASAL CELL CARCINOMA |
| <input type="checkbox"/> | <input type="checkbox"/> | SUSPECTED MELANOMA | <input type="checkbox"/> | <input type="checkbox"/> | SUSPECTED SQUAMOUS CELL CARCINOMA |

BIOPSY

| YES | NO | YES | NO |
|--------------------------|--------------------------|--------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SKIN BIOPSY PERFORMED

CONSENT FORM OBTAINED

BIOPSY LOCATION(S):

BIOPSY DIAGNOSIS:

PHYSICAL FEATURES

EYE COLOR

HAIR COLOR

SKIN COLOR

BROWN GREY
HAZEL BLUE
GREEN

100
10 20 30 40 50 60 70 80 90
0 1 2 3 4 5 6 7 8 9

0 1 2 3 4 5 6 7 8 9 10

PRINTED NAME OF EXAMINING PHYSICIAN

SIGNATURE

| | | | | | |
|--------------------|--|-----------------------|--|----------------|--|
| CASE NUMBER | | NAME: | | GROUP # | |
| | | DATE OF BIRTH: | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |

| | | | | | | | | | | | | | |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| TODAY'S | MO | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
| DATE | DAY | 30 | 20 | 10 | 3 | 3 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| | YR | 95 | 96 | 97 | 98 | 99 | 90 | 91 | 92 | 93 | 94 | 95 | 96 |

FORM AFHS-5
NEUROLOGICAL EXAMINATION

VERSION 10 DRW SCF 585

HEAD AND NECK

| | | |
|--|--|---|
| <p>YES NO</p> <p><input type="checkbox"/> <input type="checkbox"/> NORMAL TO PALPATION/INSPECTION</p> <p><input type="checkbox"/> <input type="checkbox"/> ASYMMETRY</p> <p><input type="checkbox"/> <input type="checkbox"/> DEPRESSION</p> <p><input type="checkbox"/> <input type="checkbox"/> SCAR</p> | <p style="text-align: center;">NECK RANGE OF MOTION</p> <p><input type="checkbox"/> NORMAL</p> <p><input type="checkbox"/> ABNORMAL</p> <p><input type="checkbox"/> REFUSAL</p> | <p>YES NO</p> <p><input type="checkbox"/> <input type="checkbox"/> DECREASED LEFT</p> <p><input type="checkbox"/> <input type="checkbox"/> DECREASED RIGHT</p> <p><input type="checkbox"/> <input type="checkbox"/> DECREASED FORWARD</p> <p><input type="checkbox"/> <input type="checkbox"/> DECREASED BACKWARD</p> |
|--|--|---|

MOTOR SYSTEM

| | | | |
|---|---|--|--|
| <p>HANDEDNESS</p> <p><input type="radio"/> LEFT <input type="radio"/> RIGHT</p> <p><input type="radio"/> REFUSED</p> | <p>GAIT</p> <p><input type="radio"/> NORMAL</p> <p><input type="radio"/> ABNORMAL</p> <p><input type="radio"/> REFUSED</p> | <p>YES NO</p> <p><input type="checkbox"/> <input type="checkbox"/> BROAD BASED</p> <p><input type="checkbox"/> <input type="checkbox"/> SMALL STEPPED</p> <p><input type="checkbox"/> <input type="checkbox"/> ATAXIC</p> <p><input type="checkbox"/> <input type="checkbox"/> OTHER (SPECIFY) _____</p> | <p>ASSOCIATED MOVEMENT ARM SWING</p> <p><input type="radio"/> NORMAL</p> <p><input type="radio"/> ABNORMAL LEFT</p> <p><input type="radio"/> ABNORMAL RIGHT</p> |
|---|---|--|--|

MUSCLE STATUS

| | NORMAL | ABNORMAL | INCREASED | | DECREASED | |
|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | | | LEFT | RIGHT | LEFT | RIGHT |
| BULK | <input type="radio"/> | <input type="radio"/> | | | | |
| TONE UPPER EXTREMITIES | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| LOWER EXTREMITIES | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| STRENGTH DISTAL WRIST EXTENSORS | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| ANKLE/TOE FLEXORS | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| PROXIMAL DELTOIDS | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| HIP FLEXORS | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> REFUSED | | | | | | |

ABNORMAL MOVEMENTS

TICS, CHOREAS, FASCICULATIONS

☐ NO ☐ YES → ① ② ③ ④

TENDERNESS

☐ NO ☐ YES → ① ② ③ ④

TREMOR

☐ NO ☐ YES →

EXTREMITY

| | | | |
|-----------------------|-----------------------|-----------------------|-----------------------|
| LOWER LEFT | UPPER LEFT | LOWER RIGHT | UPPER RIGHT |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

☐ RESTING NORMAL

☐ RESTING ABNORMAL

☐ ESSENTIAL NORM.

☐ ESSENTIAL AB

☐ INTENTION NORM

☐ INTENTION AB

OTHER → _____

COORDINATION

☐ REFUSED

| | NORMAL | | ABNORMAL | | |
|-------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | | | LEFT | RIGHT | BOTH |
| EQUILIBRATORY (ROMBERG) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| FINGER - NOSE - FINGER | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| HEEL - KNEE - SHIN | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| RAPIDLY ALTERNATING MOVEMENTS | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| PRONATION/SUPINATION OF HANDS | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| RAPID PATTING | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

DEEP TENDON REFLEXES

0 = ABSENT, 1 = SLUGGISH, 2 = ACTIVE, 3 = VERY ACTIVE, 4 = TRANSIENT CLONUS, 5 = SUSTAINED CLONUS

| | LEFT | | | | | RIGHT | | | | | | |
|----------|--|-----------------------|-----------------------|-----------------------|-----------------------|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | 0 | 1 | 2 | 3 | 4 | 5 | 0 | 1 | 2 | 3 | 4 | 5 |
| BICEPS | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| TRICEPS | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| PATELLAR | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| ACHILLES | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| BABINSKI | <input type="radio"/> PRESENT <input type="radio"/> ABSENT | | | | | <input type="radio"/> PRESENT <input type="radio"/> ABSENT | | | | | | |

SKILLED ACTS

SPEECH ARTICULATION, APHASIA, AGNOSIA

☐ NORMAL ☐ GROSSLY ABNORMAL

☐ DYSARTHRIA

☐ APHASIA

☐ AGNOSIA

MENINGEAL IRRITATION AND SENSORY SYSTEM

STRAIGHT LEG RAISING

LIGHT TOUCH

PIN PRICK

VIBRATION AT ANKLE 128 HZ

POSITION (GREAT TOE)

COMMENT

NORMAL

LEFT

RIGHT

BOTH

— ABNORMAL —

NERVE STATUS (TENDERNESS, TUMORS, ETC.):

CRANIAL NERVES

| LEFT | RIGHT | | LEFT | RIGHT | |
|-----------------------|-----------------------|--|-----------------------|-----------------------|-----------------------------|
| <input type="radio"/> | <input type="radio"/> | SENSE OF SMELL | <input type="radio"/> | <input type="radio"/> | CLENCH JAW SYMMETRIC |
| <input type="radio"/> | <input type="radio"/> | PRESENT | <input type="radio"/> | <input type="radio"/> | CLENCH JAW DEVIATED |
| <input type="radio"/> | <input type="radio"/> | ABSENT | <input type="radio"/> | <input type="radio"/> | |
| <input type="radio"/> | <input type="radio"/> | | <input type="radio"/> | <input type="radio"/> | SENSORY NORMAL |
| <input type="radio"/> | <input type="radio"/> | | <input type="radio"/> | <input type="radio"/> | SENSORY ABNORMAL |
| <input type="radio"/> | <input type="radio"/> | II | <input type="radio"/> | <input type="radio"/> | CORNEAL REFLEX NORMAL |
| <input type="radio"/> | <input type="radio"/> | FUNDUS | <input type="radio"/> | <input type="radio"/> | CORNEAL REF EX ABNORMAL |
| <input type="radio"/> | <input type="radio"/> | NORMAL | <input type="radio"/> | <input type="radio"/> | |
| <input type="radio"/> | <input type="radio"/> | ABNORMAL | <input type="radio"/> | <input type="radio"/> | VII |
| <input type="radio"/> | <input type="radio"/> | DISK PALLOR/ATROPHY | <input type="radio"/> | <input type="radio"/> | SMILE NORMAL |
| <input type="radio"/> | <input type="radio"/> | EXUDATE | <input type="radio"/> | <input type="radio"/> | SMILE ABNORMAL |
| <input type="radio"/> | <input type="radio"/> | PAPILDEMA | <input type="radio"/> | <input type="radio"/> | |
| <input type="radio"/> | <input type="radio"/> | HEMORRHAGE | <input type="radio"/> | <input type="radio"/> | PALPEBRAL FISSURE NORMAL |
| <input type="radio"/> | <input type="radio"/> | FIELDS NORMAL (TO CONFRONTATION) | <input type="radio"/> | <input type="radio"/> | PALPEBRAL FISSURE ABNORMAL |
| <input type="radio"/> | <input type="radio"/> | FIELDS ABNORMAL | <input type="radio"/> | <input type="radio"/> | |
| <input type="radio"/> | <input type="radio"/> | III, IV, VI | <input type="radio"/> | <input type="radio"/> | IX, XI PALATE AND UVULA |
| <input type="radio"/> | <input type="radio"/> | PUPILS <input type="radio"/> EQUAL <input type="radio"/> UNEQUAL | <input type="radio"/> | <input type="radio"/> | MOVEMENT NORMAL |
| <input type="radio"/> | <input type="radio"/> | DIFFERENCE (MM) → ① ② ③ ④ ⑤ | <input type="radio"/> | <input type="radio"/> | MOVEMENT DEVIATED |
| <input type="radio"/> | <input type="radio"/> | EYE MOVEMENT NORMAL | <input type="radio"/> | <input type="radio"/> | PALATAL REFLEX NORMAL |
| <input type="radio"/> | <input type="radio"/> | EYE MOVEMENT ABNORMAL | <input type="radio"/> | <input type="radio"/> | PALATAL REFLEX ABNORMAL |
| <input type="radio"/> | <input type="radio"/> | NYSTAGMUS ABSENT | <input type="radio"/> | <input type="radio"/> | |
| <input type="radio"/> | <input type="radio"/> | NYSTAGMUS ROTARY | <input type="radio"/> | <input type="radio"/> | XII |
| <input type="radio"/> | <input type="radio"/> | NYSTAGMUS VERTICAL | <input type="radio"/> | <input type="radio"/> | TONGUE PROTRUDED IN MIDLINE |
| <input type="radio"/> | <input type="radio"/> | NYSTAGMUS HORIZONTAL | <input type="radio"/> | <input type="radio"/> | ATROPHY OF TONGUE |
| <input type="radio"/> | <input type="radio"/> | PTOSIS PRESENT | <input type="radio"/> | <input type="radio"/> | |
| <input type="radio"/> | <input type="radio"/> | PTOSIS ABNORMAL | <input type="radio"/> | <input type="radio"/> | |
| <input type="radio"/> | <input type="radio"/> | PUPIL SHAPE/POSITION | <input type="radio"/> | <input type="radio"/> | |
| <input type="radio"/> | <input type="radio"/> | ROUND | <input type="radio"/> | <input type="radio"/> | |
| <input type="radio"/> | <input type="radio"/> | OTHER | <input type="radio"/> | <input type="radio"/> | |
| <input type="radio"/> | <input type="radio"/> | LIGHT REACTION NORMAL | <input type="radio"/> | <input type="radio"/> | |
| <input type="radio"/> | <input type="radio"/> | LIGHT REACTION ABNORMAL | <input type="radio"/> | <input type="radio"/> | |
| <input type="radio"/> | <input type="radio"/> | EYEBALL POSITION NORMAL | <input type="radio"/> | <input type="radio"/> | |
| <input type="radio"/> | <input type="radio"/> | EYEBALL POSITION ABNORMAL | <input type="radio"/> | <input type="radio"/> | |

MENTAL STATUS
(ALERT, CLEAR, COOPERATIVE, ETC.)

GROSS ABNORMALITIES? ☐ NO ☐ YES

SPECIFY

PRINTED NAME OF EXAMINING PHYSICIAN

SIGNATURE

YES NO

ADDITIONAL COMMENTS ENTERED ON FORM AFHS 7

CASE NUMBER

NAME
DATE OF BIRTH:TODAY'S
DATE

| MO | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| DAY | 30 | 20 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| YR | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 |

FORM AFHS-6

HALSTEAD NEUROPSYCHOLOGICAL TEST BATTERY

VERSION 1.0, RW, SEP 88

TRAILS A

| 100 | 200 | 300 | 400 | 500 |
|-----|-----|-----|-----|-----|
| 10 | 20 | 30 | 40 | 50 |
| 60 | 70 | 80 | 90 | |
| 0 | 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 | 9 |

TRAILS B

| 100 | 200 | 300 | 400 | 500 |
|-----|-----|-----|-----|-----|
| 10 | 20 | 30 | 40 | 50 |
| 60 | 70 | 80 | 90 | |
| 0 | 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 | 9 |

LOGICAL
MEMORY

IMMEDIATE

| 10 | 20 |
|----|----|
| 0 | 1 |
| 2 | 3 |
| 4 | 5 |
| 6 | 7 |
| 8 | 9 |

30' DELAY

| 10 | 20 |
|----|----|
| 0 | 1 |
| 2 | 3 |
| 4 | 5 |
| 6 | 7 |
| 8 | 9 |

MEMORY
FOR
DESIGNS

IMMEDIATE

| 10 | 20 |
|----|----|
| 0 | 1 |
| 2 | 3 |
| 4 | 5 |
| 6 | 7 |
| 8 | 9 |

30' DELAY

| 10 | 20 |
|----|----|
| 0 | 1 |
| 2 | 3 |
| 4 | 5 |
| 6 | 7 |
| 8 | 9 |

CATEGORIES

ONE

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|----|----|----|----|---|---|---|---|---|
| 10 | 20 | 30 | 40 | | | | | |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

TWO

| 10 | 20 | 30 | 40 |
|----|----|----|----|
| 0 | 1 | 2 | 3 |
| 4 | 5 | 6 | 7 |
| 8 | 9 | | |

THREE

| 10 | 20 | 30 | 40 |
|----|----|----|----|
| 0 | 1 | 2 | 3 |
| 4 | 5 | 6 | 7 |
| 8 | 9 | | |

FOUR

| 10 | 20 | 30 | 40 |
|----|----|----|----|
| 0 | 1 | 2 | 3 |
| 4 | 5 | 6 | 7 |
| 8 | 9 | | |

FIVE

| 10 | 20 | 30 | 40 |
|----|----|----|----|
| 0 | 1 | 2 | 3 |
| 4 | 5 | 6 | 7 |
| 8 | 9 | | |

SIX

| 10 | 20 | 30 | 40 |
|----|----|----|----|
| 0 | 1 | 2 | 3 |
| 4 | 5 | 6 | 7 |
| 8 | 9 | | |

SEVEN

| 10 | 20 |
|----|----|
| 0 | 1 |
| 2 | 3 |
| 4 | 5 |
| 6 | 7 |
| 8 | 9 |

TOTAL

| 100 | 10 | 20 |
|-----|----|----|
| 0 | 1 | 2 |
| 30 | 40 | |
| 50 | 60 | |
| 70 | 80 | |
| 90 | 90 | |

TPT

BOTH

| MIN | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|-----|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|
| SEC | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 20 | 30 | 40 | 50 | |

MEMORY

| 0 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|----|---|
| 6 | 7 | 8 | 9 | 10 | |

TOTAL

DOMINANT

| MIN | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|-----|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|
| SEC | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 20 | 30 | 40 | 50 | |

LOC

| 0 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|----|---|
| 6 | 7 | 8 | 9 | 10 | |

MIN SEC

NON DOMINANT

| MIN | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|-----|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|
| SEC | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 20 | 30 | 40 | 50 | |

SEASHORE RHYTHM

CORRECT

| 10 | 20 | 30 |
|----|----|----|
| 0 | 1 | 2 |
| 3 | 4 | 5 |
| 6 | 7 | 8 |
| 9 | | |

RANK

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|----|
| | | | | | | | | | |

SPEECH PERCEPTION

OF ERRORS

| 10 | 20 | 30 | 40 | 50 | 60 |
|----|----|----|----|----|----|
| 0 | 1 | 2 | 3 | 4 | 5 |
| 6 | 7 | 8 | 9 | | |

GRIP STRENGTH

DOMINANT

| 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
|----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

NON

DOMINANT

| 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
|----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

TAPPING

DOMINANT

| 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
|----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

NON

DOMINANT

| 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
|----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

DOMINANT IS

LEFT


RIGHT

IMPAIRMENT INDEX

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|----|
| | | | | | | | | | | |

PRINTED NAME OF EXAMINER

SIGNATURE

| | | | | |
|-------------------------------------|----------|----------------------------|----------|---|
| CASE NUMBER | | NAME OF PARTICIPANT | |  |
| | B | LAST | FIRST MI | |
| CONTINUATION OF FORM AFHS- _____ | | FORM AFHS-7 CONTINUATION | | |

USE THIS FORM TO RECORD COMMENTS, OBSERVATIONS, OR PHYSICAL FINDINGS FOR WHICH THERE IS INADEQUATE SPACE ON THE OPTICAL MARK SENSE FORMS. PLEASE INDICATE THE ORGAN SYSTEM, IF APPROPRIATE, IN EACH COMMENT BLOCK.

| |
|---------------|
| ORGAN SYSTEM: |
| COMMENTS |

| |
|---------------|
| ORGAN SYSTEM: |
| COMMENTS |

| |
|---------------|
| ORGAN SYSTEM: |
| COMMENTS |

| |
|---------------|
| ORGAN SYSTEM: |
| COMMENTS |

| |
|-------------------------------------|
| PRINTED NAME OF EXAMINING PHYSICIAN |
|-------------------------------------|

| | |
|-----------|------|
| SIGNATURE | DATE |
|-----------|------|

CASE NUMBER

NAME
DATE OF BIRTH

GROUP #

TODAY'S
DATE

| MO | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| DAY | 30 | 28 | 31 | 30 | 31 | 30 | 31 | 31 | 30 | 31 | 30 | 31 |
| YR | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 |

FORM AFHS-8

VIETNAM COMBAT INDEX

VERSION 10 URW SCF 888

INSTRUCTIONS

INSTRUCTIONS ARE INCLUDED WITH EACH QUESTION. BELOW IS AN EXAMPLE OF THE CORRECT WAY TO ANSWER EACH QUESTION.

EXAMPLE DO YOU PLAN TO DO ANY OF THE FOLLOWING NEXT WEEK? PLEASE BLACKEN EITHER "YES" OR "NO"

YES NO

- ☒ VISIT A RELATIVE
☒ GO TO A MUSEUM
☒ GO TO A MOVIE

I WILL VISIT A RELATIVE
AND GO TO A MOVIE NEXT
WEEK)

AIRCRAFT

PLEASE INDICATE WHETHER YOU SERVED OR FLEW IN ANY OF THE FOLLOWING AIRCRAFT WHILE IN VIETNAM. DO NOT INCLUDE TRANSPORTATION TO OR FROM VIETNAM)

WERE YOU EVER A
CREW MEMBER?

YES NO

| YES | NO | YES | NO |
|----------------------------------|--|----------------------------------|--|
| <input checked="" type="radio"/> | <input checked="" type="radio"/> F-4 | <input checked="" type="radio"/> | <input checked="" type="radio"/> C-7 |
| <input checked="" type="radio"/> | <input checked="" type="radio"/> F-5 | <input checked="" type="radio"/> | <input checked="" type="radio"/> C-54 |
| <input checked="" type="radio"/> | <input checked="" type="radio"/> F-105 | <input checked="" type="radio"/> | <input checked="" type="radio"/> C-118 |
| <input checked="" type="radio"/> | <input checked="" type="radio"/> B-52 | <input checked="" type="radio"/> | <input checked="" type="radio"/> C-123 |
| <input checked="" type="radio"/> | <input checked="" type="radio"/> B-66 | <input checked="" type="radio"/> | <input checked="" type="radio"/> C-130 |

EXPERIENCES


BELOW IS A LIST OF DIFFERENT COMBAT ROLES AND FLYING EXPERIENCES THAT AIRCRAFT PERSONNEL HAD DURING THE VIETNAM WAR. FOR EACH STATEMENT PLEASE BLACKEN THE FIRST CIRCLE IF YOU HAD THAT EXPERIENCE DURING THE VIETNAM WAR OR THE "NO" CIRCLE IF YOU DID NOT. PLEASE BLACKEN EITHER "YES" OR "NO" FOR EACH EXPERIENCE.

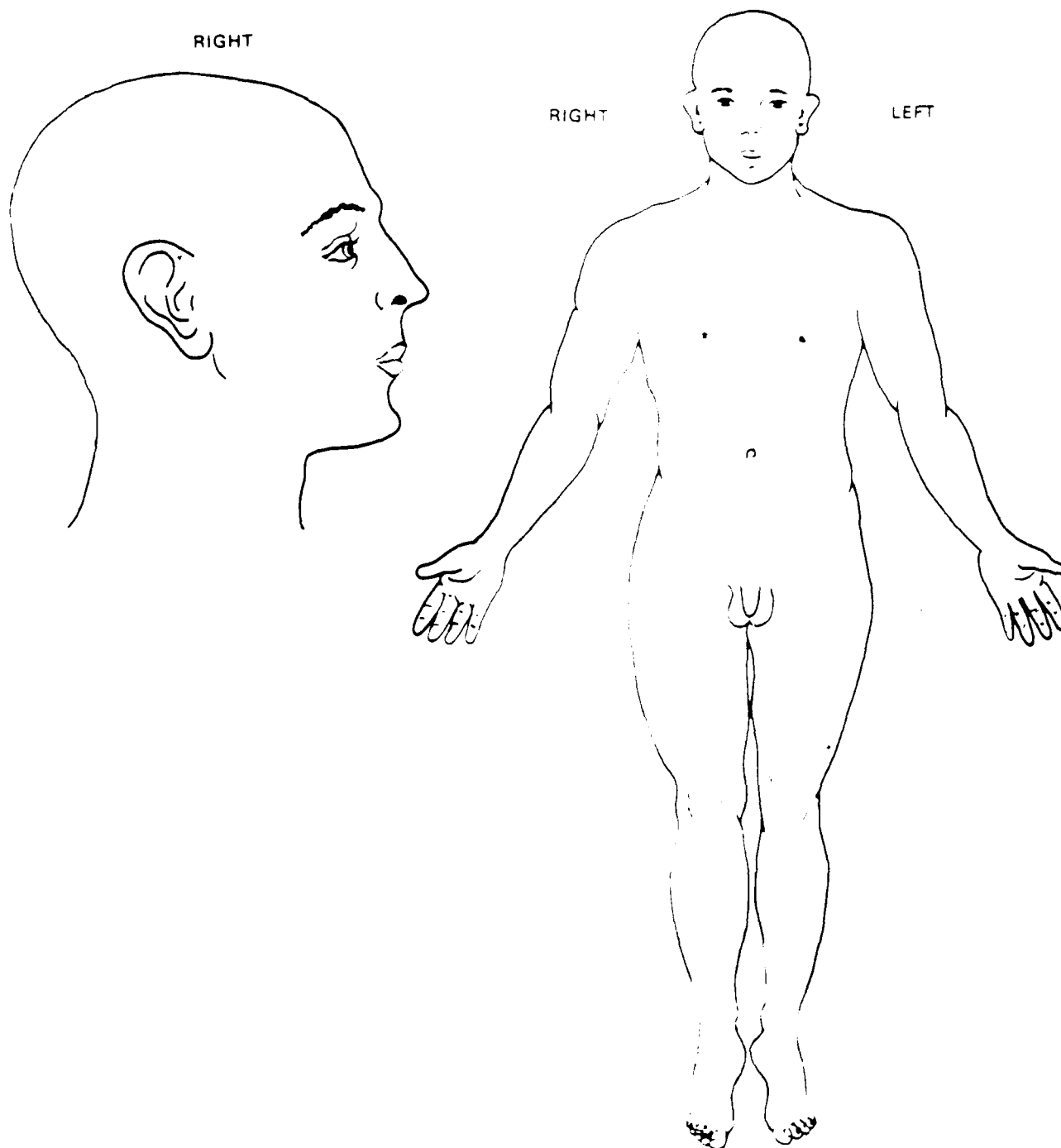
YES NO

- ☒ ☒ RECEIVED COMBAT PAY
☒ ☒ CRASH LANDED, BAILED OUT, OR SHOT DOWN
☒ ☒ RECEIVED SNIPER OR SAPPER FIRE IN OR AROUND BASE
☒ ☒ MOVED KILLED OR WOUNDED PERSONNEL
☒ ☒ SERVED AS A FORWARD AIR CONTROLLER (FAC)
☒ ☒ FLEW IN THE SAME AIRCRAFT WHEN FELLOW CREWMEMBER WAS WOUNDED OR KILLED
☒ ☒ FLEW IN THE SAME FORMATION OR ON THE SAME SORTIE WHEN A FELLOW CREWMEMBER WAS WOUNDED OR KILLED

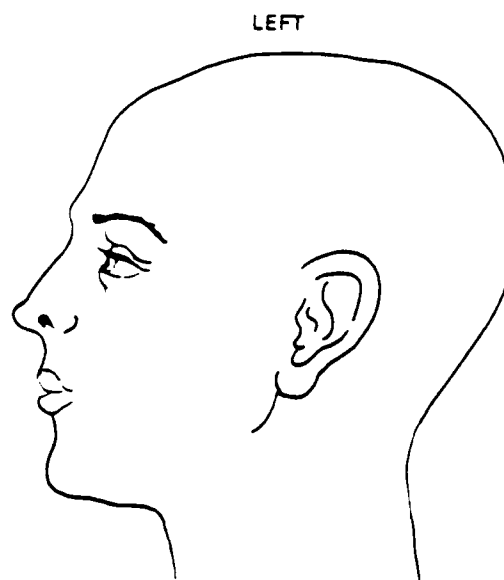
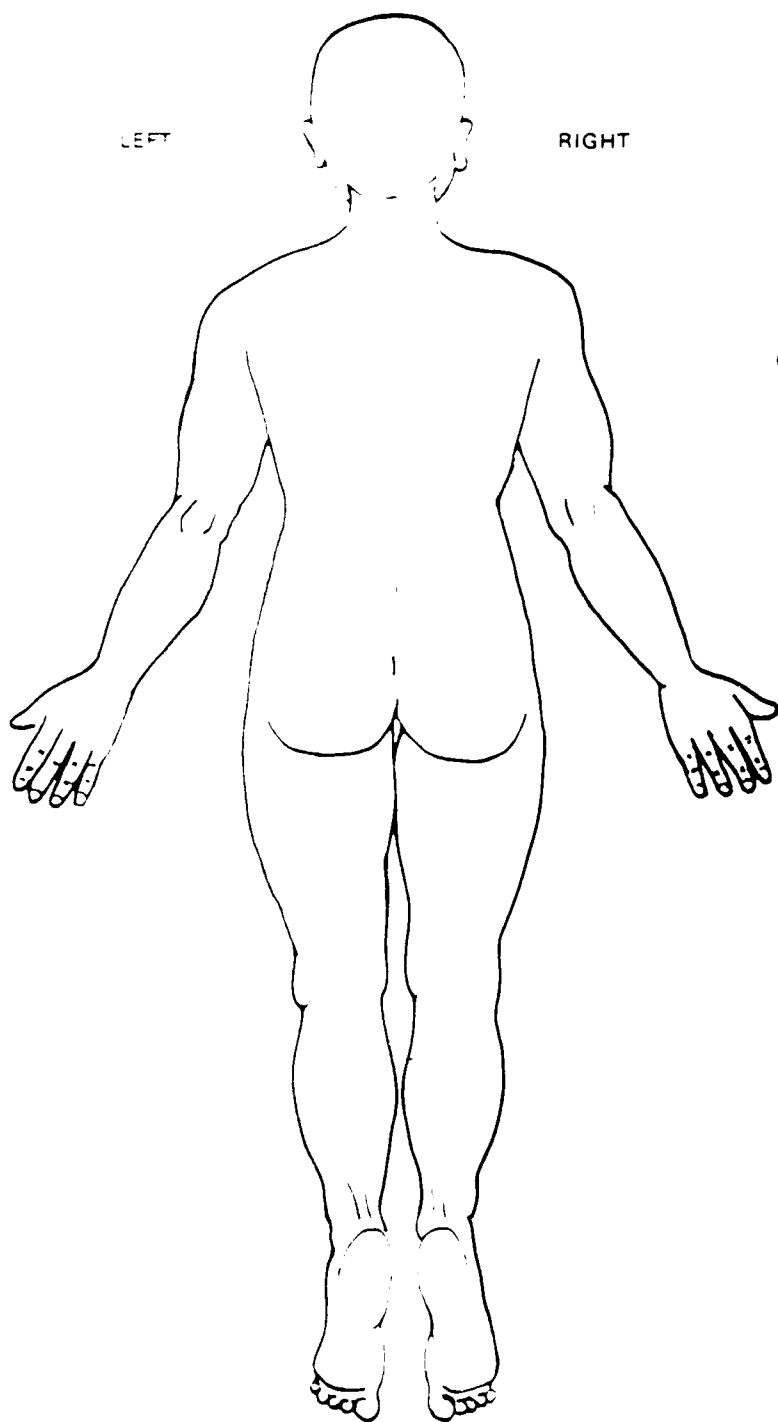
YES NO

- ☒ ☒ FLEW IN AN AIRCRAFT THAT SUSTAINED BATTLE DAMAGE
☒ ☒ RECEIVED NOCTURNAL FLIGHT TRAINING
☒ ☒ FIRE AT HOME BASE OR CAMP
☒ ☒ ENCOUNTERED MINES OR LANDMINE TRAPS
☒ ☒ KILLED VC OR NVA IN A BOMBING RUN
☒ ☒ WOUNDED
☒ ☒ HAD A CLOSE FRIEND KILLED IN ACTION
☒ ☒ ENGAGED VC OR NVA IN A FREIGHT
☒ ☒ CAPTURED BY THE ENEMY

| | | | | | |
|--|--|------------------------------|-------|----|---|
| CASE NUMBER | | LAST | FIRST | MI |  |
| <div style="border: 1px solid black; padding: 2px; display: inline-block;">B</div> | | NAME OF PARTICIPANT | | | |
| ATTACHMENT TO FORM | | FORM AFHS-9 ANATOMICAL CHART | | | |
| AFHS-_____ | | | | | |




(OVER)

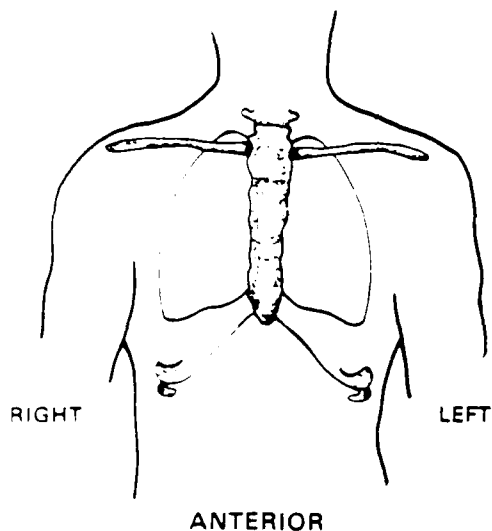


PRINTED NAME OF EXAMINING PHYSICIAN

SIGNATURE

DATE

| | | | | | | | |
|---------------------------|-----|----|----------------------------|----------------------------|-------|----|---|
| CASE NUMBER | | | | NAME OF PARTICIPANT | | |  |
| | | | B | LAST | FIRST | MI | |
| DATE OF X RAY | | | | FORM AFHS-11 | | | |
| MO | DAY | YR | PA CHEST X-RAY EXAMINATION | | | | |
| X RAY TECHNICIAN INITIALS | | | | | | | |



PLEASE MARK THE LOCATION OF ANY SUSPECTED ABNORMALITY(IES) WITH AN ENCIRCLED NUMBER AND DESCRIBE BELOW.

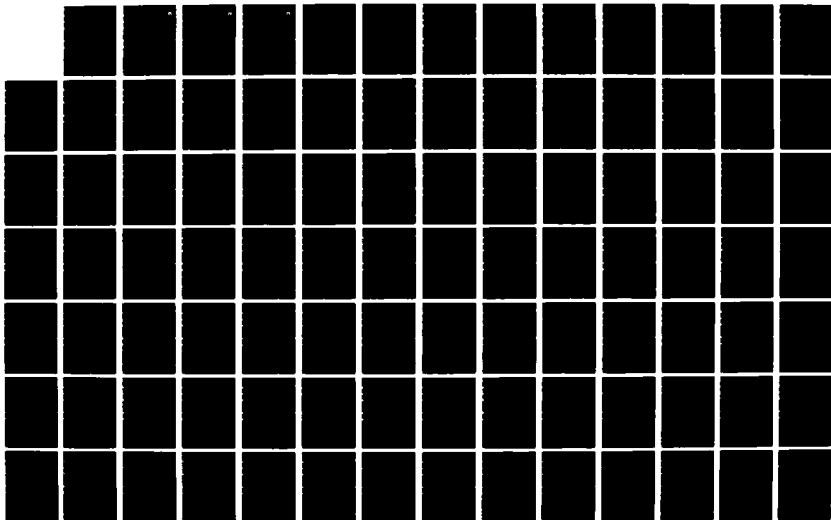
INTERPRETATION OF PA CHEST FILM

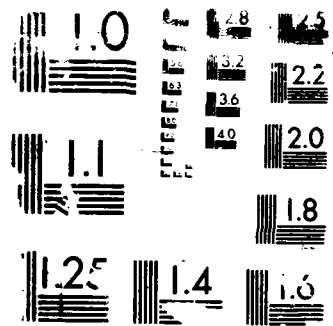
| | | | |
|--------------------------|--------|-------------------------------------|----------|
| <input type="checkbox"/> | NORMAL | <input checked="" type="checkbox"/> | ABNORMAL |
|--------------------------|--------|-------------------------------------|----------|

COMMENTS:


PRINTED NAME OF RADIOLOGIST

AD-A189 556 AN EPIDEMIOLOGIC INVESTIGATION OF HEALTH EFFECTS IN AIR 2/5
FORCE PERSONNEL F (U) SCIENCE APPLICATIONS
INTERNATIONAL CORP MCLEAN VA G D LATHROP ET AL
UNCLASSIFIED 01 OCT 87 USAFSAM-TR-87-27-VOL-2 F/G 6/11 ML





RESOLUTION CHART

| | | | | | | | |
|-----------------------|--|-----|----------|------------------------------|---------------|--|---|
| CASE NUMBER | | | | NAME OF PARTICIPANT | | |  |
| | | | B | LAST FIRST MI | | | |
| DATE OF DIAGNOSIS | | MO | DAY | YR | FORM AFHS-16A | | |
| OUTBRIEFING CONDUCTED | | YES | NO | DIAGNOSTIC SUMMARY (MEDICAL) | | | |

CHECK ONE

| ICD 9 CM CODE | PRE EXISTING | NEWLY DIAGNOSED | DIAGNOSES BASED ON PHYSICAL EXAMS, ECG, DOPPLER, CHEST X-RAY, SKIN TESTS, AND LABORATORY STUDIES |
|---------------|--------------|-----------------|--|
| | | | |
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| | | | |
| | | | |

COMMENTS:

PRINTED NAME OF DIAGNOSTICIAN

SIGNATURE

APPENDIX D

Study Selection and Participation Bias

TELEPHONE QUESTIONNAIRE

1. Compared to other people your age, would you say that your health is:

Excellent.....1
Good.....2
Fair.....3
Poor.....4

-
2. Are you currently taking prescribed medicines for any illness or condition?

Yes.....1 (ANSWER A) No.....2 (GO TO QUESTION 3)

- A. For what illness or condition are you taking prescribed medicines?

-
3. Within the last six months, did illness or injury keep you from going to work or from holding a job? Please do not count work around the house as a job.

Yes.....1 (ANSWER A and B) No.....2 (GO TO QUESTION 4)

- A. How many days or weeks did you miss from work within the past six months?

Days Missed |____|____|____|

OR

Weeks Missed |____|____|____|

Not Able to Work at all.....995

- B. What illnesses or conditions caused you to miss work or prevented you from holding a job?

4. Do you need the help of another person, or use of special equipment, to take care of personal needs such as eating, bathing, dressing, or getting up or around the house? [By "special equipment" we mean anything you use to help yourself, like a wheelchair, railing, walker, cane or other device, which is not usually used by most people.]

Yes.....1 (ANSWER A and B) No.....2 (GO TO QUESTION 5)

- A. Is this help required because of a condition you've already mentioned, or because of some other health condition?

Another condition.....1 (ANSWER B) Condition.....2 (GO TO
already mentioned QUESTION 5)

- B. What illness or condition is that?

5. Now on to a different subject. Did you earn any income from any job in 1984?

Yes.....1 (ANSWER A) No.....2 (DO NOT ANSWER A)

- A. What was your income in 1984?

Less than \$20,000.....1
\$20,000 to \$40,000.....2
More than \$40,000.....3

NAME _____
CASE ID | _ | _ | _ | _ | _ |
PHONE # (_) _____

**Correlation Matrix of 26 Variables at Baseline,
as Determined by 1,154 Nonblack Comparisons**

[illegible]

Correlation Matrix of 20 Variables at First Followup, as Determined by 1,293 Comparisons

D-4

APPENDIX E
Statistical Methods

TEST: compare C with B for 3 way interactions: Is $p \text{ value} > 0.05$ for the global test of all 3 way interactions AND $p \text{ value} > 0.05$ for each individual 3 way interaction? (i.e., can all 3 way interactions be dropped?)

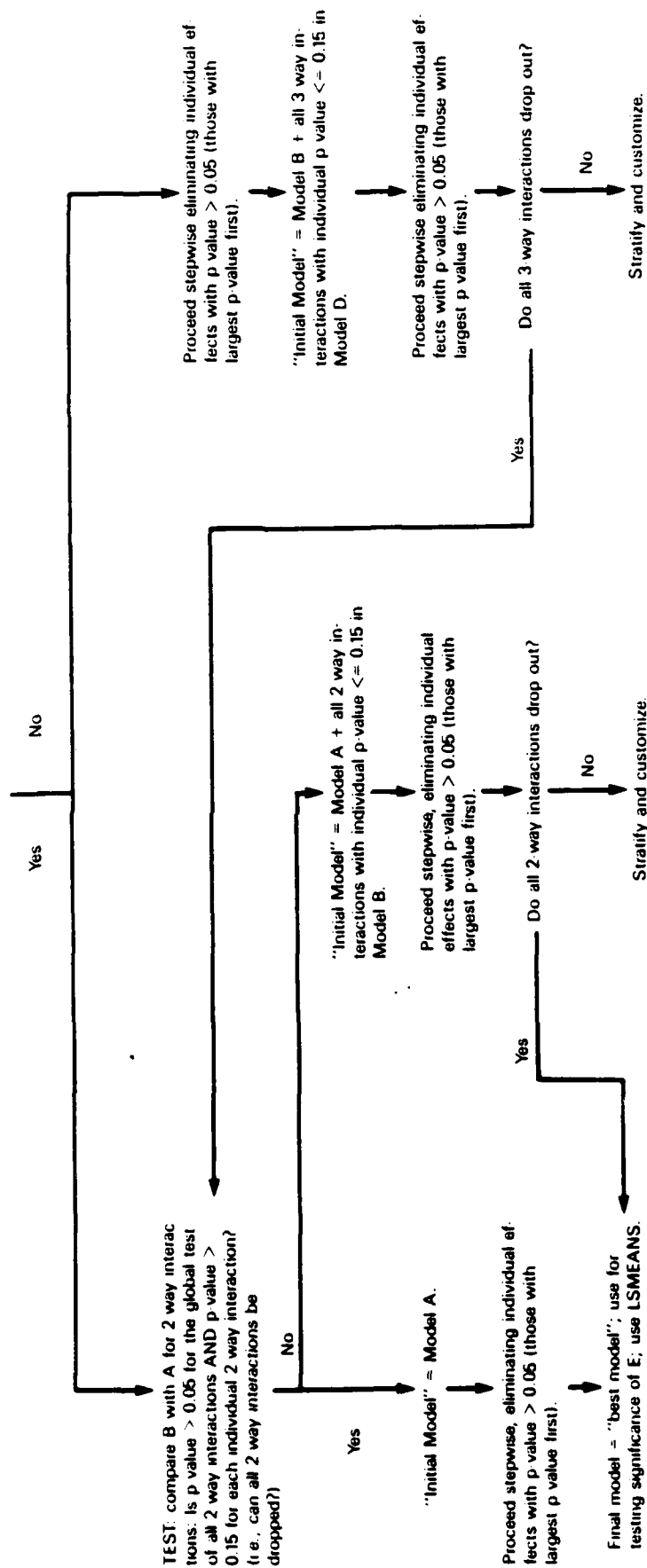


Figure E-1.
Modeling Strategy

Continuous Dependent Variable:

Use SAS® general linear models (GLM) procedure and follow the chart.

Dichotomous Dependent Variable:

Use BMDP®-LR (logistic regression) with MLR option, and follow the chart.
If the number of covariates is huge, use ACE option for Models A, B, C.

Polychotomous Dependent Variable:

Use BMDP®-4F (log-linear model) adding "delta" = 0.1 to each cell, and follow the chart. Use LAMB and COV options for parameter estimates when "best model" found.

APPENDIX F
Exposure Index

TABLE F-1.

**Herbicide Orange Equivalent Gallons and
Ranch Hand Manning by Month**

| Mo./Yr. | Gallons Sprayed | Pilot (Occ. 1) | Navigator (Occ. 2) | Officer- Other (Occ. 3) | Enlisted Flyer (Occ. 4) | Enlisted- Other (Occ. 5) |
|---------|--------------------|-------------------|-----------------------|-------------------------------|-------------------------------|--------------------------------|
| 10/61 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11/61 | 0 | 5 | 11 | 1 | 6 | 14 |
| 12/61 | 0 | 9 | 2 | 1 | 7 | 20 |
| 01/62 | 191,426 | 14 | 2 | 1 | 7 | 23 |
| 02/62 | 324,216 | 14 | 2 | 1 | 7 | 23 |
| 03/62 | 191,426 | 15 | 2 | 1 | 7 | 20 |
| 04/62 | 0 | 16 | 2 | 1 | 6 | 14 |
| 05/62 | 0 | 15 | 3 | 1 | 6 | 13 |
| 06/62 | 0 | 12 | 2 | 0 | 5 | 7 |
| 07/62 | 0 | 13 | 2 | 0 | 5 | 4 |
| 08/62 | 0 | 11 | 2 | 0 | 5 | 5 |
| 09/62 | 334,126 | 12 | 2 | 0 | 5 | 6 |
| 10/62 | 334,126 | 9 | 1 | 0 | 5 | 6 |
| 11/62 | 0 | 10 | 0 | 0 | 5 | 5 |
| 12/62 | 90,879 | 8 | 0 | 0 | 4 | 5 |
| 01/63 | 0 | 9 | 0 | 0 | 5 | 4 |
| 02/63 | 0 | 7 | 1 | 0 | 5 | 4 |
| 03/63 | 0 | 12 | 1 | 0 | 5 | 6 |
| 04/63 | 0 | 12 | 1 | 0 | 5 | 6 |
| 05/63 | 0 | 10 | 1 | 0 | 5 | 7 |
| 06/63 | 174,024 | 10 | 1 | 0 | 4 | 7 |
| 07/63 | 259,150 | 11 | 1 | 0 | 8 | 6 |
| 08/63 | 0 | 8 | 0 | 0 | 8 | 4 |
| 09/63 | 0 | 10 | 1 | 1 | 9 | 4 |
| 10/63 | 339,588 | 7 | 1 | 1 | 9 | 6 |
| 11/63 | 377,172 | 6 | 1 | 1 | 10 | 6 |
| 12/63 | 942,630 | 5 | 1 | 1 | 6 | 6 |
| 01/64 | 121,454 | 7 | 1 | 1 | 7 | 5 |
| 02/64 | 363,758 | 5 | 1 | 0 | 7 | 4 |
| 03/64 | 755,312 | 8 | 1 | 0 | 5 | 4 |
| 04/64 | 56799 | 9 | 1 | 0 | 6 | 2 |
| 05/64 | 152,271 | 10 | 2 | 0 | 5 | 2 |
| 06/64 | 612,709 | 7 | 3 | 0 | 5 | 2 |
| 07/64 | 282,789 | 9 | 3 | 0 | 6 | 3 |
| 08/64 | 777,669 | 9 | 3 | 0 | 5 | 3 |
| 09/64 | 1,413,945 | 8 | 3 | 0 | 4 | 2 |
| 10/64 | 1,413,945 | 9 | 3 | 0 | 4 | 2 |
| 11/64 | 1,413,945 | 11 | 3 | 0 | 4 | 1 |
| 12/64 | 1,413,945 | 10 | 3 | 0 | 6 | 1 |
| 01/65 | 1,296,116 | 11 | 4 | 0 | 6 | 1 |
| 02/65 | 1,437,510 | 12 | 5 | 0 | 6 | 1 |
| 03/65 | 730,538 | 13 | 4 | 1 | 6 | 1 |

TABLE F-1. (continued)

**Herbicide Orange Equivalent Gallons and
Ranch Hand Manning by Month**

| Mo./Yr. | Gallons Sprayed | Pilot (Occ. 1) | Navigator (Occ. 2) | Officer- Other (Occ. 3) | Enlisted Flyer (Occ. 4) | Enlisted- Other (Occ. 5) |
|---------|--------------------|-------------------|-----------------------|-------------------------------|-------------------------------|--------------------------------|
| 04/65 | 659,841 | 14 | 3 | 1 | 6 | 2 |
| 05/65 | 1,767,431 | 15 | 4 | 1 | 6 | 2 |
| 06/65 | 0 | 16 | 4 | 1 | 7 | 4 |
| 07/65 | 942,630 | 19 | 4 | 1 | 7 | 3 |
| 08/65 | 26,500 | 19 | 4 | 1 | 7 | 3 |
| 09/65 | 44,650 | 22 | 4 | 1 | 6 | 3 |
| 10/65 | 78,850 | 23 | 4 | 1 | 6 | 6 |
| 11/65 | 106,900 | 24 | 6 | 1 | 10 | 12 |
| 12/65 | 148,525 | 23 | 5 | 1 | 11 | 12 |
| 01/66 | 152,450 | 21 | 6 | 1 | 10 | 16 |
| 02/66 | 129,150 | 22 | 6 | 1 | 10 | 26 |
| 03/66 | 135,600 | 21 | 4 | 2 | 10 | 32 |
| 04/66 | 141,050 | 22 | 5 | 2 | 10 | 37 |
| 05/66 | 183,900 | 21 | 6 | 2 | 9 | 38 |
| 06/66 | 191,830 | 20 | 6 | 2 | 10 | 41 |
| 07/66 | 112,300 | 21 | 8 | 2 | 9 | 45 |
| 08/66 | 192,050 | 26 | 8 | 2 | 11 | 46 |
| 09/66 | 213,970 | 28 | 9 | 2 | 12 | 62 |
| 10/66 | 122,040 | 34 | 8 | 3 | 16 | 85 |
| 11/66 | 164,800 | 41 | 8 | 4 | 18 | 104 |
| 12/66 | 212,100 | 45 | 9 | 5 | 28 | 123 |
| 01/67 | 202,360 | 49 | 9 | 5 | 28 | 123 |
| 02/67 | 363,830 | 59 | 13 | 5 | 28 | 116 |
| 03/67 | 285,400 | 51 | 13 | 4 | 28 | 114 |
| 04/67 | 208,300 | 50 | 14 | 4 | 33 | 108 |
| 05/67 | 251,320 | 53 | 15 | 4 | 34 | 101 |
| 06/67 | 335,860 | 55 | 13 | 3 | 36 | 105 |
| 07/67 | 253,884 | 51 | 15 | 3 | 37 | 163 |
| 08/67 | 162,895 | 63 | 13 | 4 | 32 | 160 |
| 09/67 | 298,615 | 60 | 18 | 5 | 33 | 161 |
| 10/67 | 265,335 | 55 | 19 | 5 | 36 | 149 |
| 11/67 | 372,425 | 55 | 17 | 6 | 33 | 145 |
| 12/67 | 383,605 | 58 | 18 | 6 | 34 | 129 |
| 01/68 | 333,595 | 54 | 19 | 6 | 33 | 127 |
| 02/68 | 27,450 | 65 | 19 | 6 | 35 | 141 |
| 03/68 | 48,200 | 69 | 20 | 5 | 34 | 160 |
| 04/68 | 307,740 | 72 | 20 | 6 | 36 | 161 |
| 05/68 | 336,300 | 75 | 18 | 6 | 32 | 160 |
| 06/68 | 226,325 | 77 | 18 | 6 | 37 | 164 |

TABLE F-1. (continued)

**Herbicide Orange Equivalent Gallons and
Ranch Hand Manning by Month**

| Mo./Yr. | Gallons Sprayed | Pilot (Occ. 1) | Navigator (Occ. 2) | Officer- Other (Occ. 3) | Enlisted Flyer (Occ. 4) | Enlisted- Other (Occ. 5) |
|---------|--------------------|-------------------|-----------------------|-------------------------------|-------------------------------|--------------------------------|
| 07/68 | 258,100 | 84 | 19 | 7 | 42 | 187 |
| 08/68 | 289,160 | 91 | 18 | 9 | 45 | 192 |
| 09/68 | 216,300 | 89 | 22 | 8 | 44 | 147 |
| 10/68 | 72,250 | 89 | 20 | 8 | 49 | 155 |
| 11/68 | 189,100 | 101 | 17 | 7 | 53 | 153 |
| 12/68 | 218,750 | 94 | 17 | 8 | 51 | 154 |
| 01/69 | 264,450 | 98 | 19 | 7 | 51 | 154 |
| 02/69 | 197,450 | 91 | 18 | 5 | 51 | 166 |
| 03/69 | 356,500 | 90 | 17 | 5 | 53 | 172 |
| 04/69 | 339,800 | 94 | 20 | 6 | 54 | 161 |
| 05/69 | 353,800 | 93 | 19 | 6 | 54 | 151 |
| 06/69 | 383,533 | 88 | 19 | 7 | 57 | 155 |
| 07/69 | 287,425 | 91 | 16 | 6 | 55 | 152 |
| 08/69 | 299,100 | 85 | 16 | 6 | 55 | 155 |
| 09/69 | 206,800 | 83 | 15 | 6 | 61 | 142 |
| 10/69 | 181,000 | 83 | 17 | 6 | 61 | 122 |
| 11/69 | 205,100 | 90 | 16 | 6 | 60 | 118 |
| 12/69 | 276,900 | 76 | 16 | 5 | 52 | 114 |
| 01/70 | 186,350 | 66 | 15 | 5 | 54 | 116 |
| 02/70 | 152,100 | 58 | 15 | 5 | 41 | 122 |
| 03/70 | 153,730 | 59 | 13 | 5 | 39 | 125 |
| 04/70 | 45,700 | 54 | 13 | 5 | 37 | 109 |
| 05/70 | 0 | 51 | 14 | 5 | 29 | 94 |
| 06/70 | 0 | 47 | 14 | 3 | 18 | 84 |
| 07/70 | 0 | 44 | 11 | 2 | 16 | 74 |
| 08/70 | 0 | 40 | 9 | 1 | 14 | 63 |
| 09/70 | 0 | 40 | 7 | 1 | 13 | 43 |
| 10/70 | 0 | 34 | 6 | 1 | 14 | 37 |
| 11/70 | 0 | 30 | 5 | 1 | 15 | 35 |
| 12/70 | 0 | 25 | 4 | 1 | 13 | 30 |
| 01/71 | 0 | 23 | 4 | 1 | 14 | 28 |
| 02/71 | 0 | 23 | 4 | 1 | 14 | 28 |
| 03/71 | 0 | 23 | 4 | 1 | 14 | 28 |
| 04/71 | 0 | 23 | 4 | 1 | 14 | 28 |
| 05/71 | 0 | 23 | 4 | 1 | 14 | 28 |
| 06/71 | 0 | 28 | 4 | 1 | 14 | 28 |
| 07/71 | 0 | 29 | 4 | 1 | 14 | 28 |
| 08/71 | 0 | 29 | 4 | 1 | 14 | 28 |
| 09/71 | 0 | 29 | 4 | 1 | 14 | 28 |
| 10/71 | 0 | 29 | 4 | 1 | 14 | 28 |

Source: Baseline Morbidity Report, 24 February 1984.

APPENDIX G
General Health

APPENDIX G: General Health

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TABLE G-1.

Summary Statistics for
General Health Covariates by Group

| Covariate | Covariate Category | Group | | p-Value |
|-------------------|---------------------|-----------------------|-----------------------|---------|
| | | Ranch Hand Percent | Comparison Percent | |
| Race | Black | 5.9 | 6.4 | 0.673 |
| | Nonblack | 94.1 | 93.6 | |
| Occupation | Officer | 37.4 | 37.4 | 0.727 |
| | Enlisted Flyer | 17.4 | 16.2 | |
| | Enlisted Groundcrew | 45.2 | 46.3 | |
| | | <u>Mean±SE</u> | <u>Mean±SE</u> | |
| Age (at Baseline) | -- | 43.94±0.24 | 43.85±0.22 | 0.789 |
| Personality Score | -- | -1.18±0.29 | -1.56±0.25 | 0.332 |

-- Covariate not categorized for these results.

TABLE G-2.

Unadjusted Analysis for Self-Perception of Health by Group
(Original Comparisons Only)

| Group | Self-Perception of Health | | | | | | | | Total |
|---------------------|---------------------------|---------|--------|---------|--------|---------|--------|---------|-------|
| | Excellent | | Good | | Fair | | Poor | | |
| | Number | Percent | Number | Percent | Number | Percent | Number | Percent | |
| Ranch Hand | 490 | 48.2 | 434 | 42.7 | 74 | 7.3 | 18 | 1.8 | 1,016 |
| Original Comparison | 490 | 51.3 | 403 | 42.2 | 55 | 5.8 | 7 | 0.7 | 955 |
| p=0.075 | | | | | | | | | |

TABLE G-3.

Unadjusted Analysis for Appearance of Acute
Illness or Distress by Group
(Original Comparisons Only)

| Group | Acute Illness or Distress | | | | Total | p-Value* |
|---------------------|---------------------------|---------|--------|---------|-------|----------|
| | Yes | | No | | | |
| | Number | Percent | Number | Percent | | |
| Ranch Hand | 4 | 0.4 | 1,010 | 99.6 | 1,014 | 0.340 |
| Original Comparison | 6 | 0.6 | 949 | 99.4 | 955 | |

*Fisher's exact test, 1-sided.

TABLE G-4.

Unadjusted Analysis for Appearance of Relative Age by Group
(Original Comparisons Only)

| Group | Appearance of Relative Age | | | | | | Total | p-Value |
|---------------------|----------------------------|---------|--------|---------|--------|---------|-------|---------|
| | Younger | | Same | | Older | | | |
| | Number | Percent | Number | Percent | Number | Percent | | |
| Ranch Hand | 16 | 1.6 | 957 | 94.3 | 42 | 4.1 | 1,015 | 0.454 |
| Original Comparison | 9 | 0.9 | 906 | 94.9 | 40 | 4.2 | 955 | |

TABLE G-5.

**Adjusted Relative Risks of Appearance of
Relative Age by Occupation
(Original Comparisons Only)**

| Occupation | Adjusted Relative Risk | 95% C.I. | p-Value |
|---------------------|---------------------------|-------------|---------|
| Officer | 3.27 | (0.67,15.8) | 0.142 |
| Enlisted Flyer | 0.47 | (0.20,1.12) | 0.089 |
| Enlisted Groundcrew | 1.17 | (0.65,2.08) | 0.603 |

TABLE G-6.

**Unadjusted Analysis for Sedimentation Rate by Group
(Original Comparisons Only)**

| Group | Sedimentation Rate | | | | Total | p-Value |
|---------------------|---------------------|---------|-----------------------|---------|-------|---------|
| | Normal ≤20 mm/hr | | Abnormal >20 mm/hr | | | |
| | Number | Percent | Number | Percent | | |
| Ranch Hand | 957 | 94.2 | 59 | 5.8 | 1,016 | 0.059 |
| Original Comparison | 918 | 96.1 | 37 | 3.9 | 955 | |

TABLE G-7.

Unadjusted Analysis for Percent Body Fat by Group
(Original Comparisons Only)

| Group | Percent Body Fat | | | | Total | p-Value |
|------------------------|---------------------|---------|---------------|---------|-------|---------|
| | Lean/Normal ≤25% | | Obese >25% | | | |
| | Number | Percent | Number | Percent | | |
| Ranch Hand | 831 | 81.8 | 185 | 18.2 | 1,016 | 0.230 |
| Original Comparison | 759 | 79.6 | 195 | 20.4 | 954 | |

APPENDIX H

Malignancy

APPENDIX H: Malignancy

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TABLE H-1.

Unadjusted Analyses of Followup Participants with Verified and Suspected Neoplasms in the Baseline-Followup Interval by Group
(Nonblacks and Blacks, Original Comparisons Only)

| Site | Neoplasm Behavior and Status | Group* | | | | Total** | p-Value*** |
|------------------------|--|------------|---------|------------------------|---------|---------|------------|
| | | Ranch Hand | | Original Comparison | | | |
| | | Number** | Percent | Number** | Percent | | |
| Skin | Malignant | | | | | | |
| | Verified | 37 | 3.6 | 31 | 3.2 | 68 | 0.711 |
| | Verified and Suspected | 47 | 4.6 | 45 | 4.7 | 92 | 0.999 |
| | Benign | | | | | | |
| | Verified | 76 | 7.5 | 65 | 6.8 | 141 | 0.600 |
| | Verified and Suspected | 78 | 7.7 | 68 | 7.1 | 146 | 0.667 |
| | Uncertain Behavior and Unspecified Nature: | | | | | | |
| | Verified | 1 | 0.1 | 1 | 0.1 | 2 | 0.999 |
| | Verified and Suspected | 1 | 0.1 | 1 | 0.1 | 2 | 0.999 |
| | Any Skin Neoplasm ^a | | | | | | |
| Verified | 114 | 11.2 | 96 | 10.1 | 210 | 0.422 | |
| Verified and Suspected | 124 | 12.2 | 113 | 11.8 | 237 | 0.835 | |
| Systemic | Malignant | | | | | | |
| | Verified | 8 | 0.8 | 6 | 0.6 | 14 | 0.791 |
| | Verified and Suspected | 12 | 1.2 | 11 | 1.2 | 23 | 0.999 |
| | Benign | | | | | | |
| | Verified | 42 | 4.1 | 41 | 4.3 | 83 | 0.911 |
| | Verified and Suspected | 48 | 4.7 | 49 | 5.1 | 97 | 0.679 |
| | Uncertain Behavior and Unspecified Nature: | | | | | | |
| | Verified | 6 | 0.6 | 6 | 0.6 | 12 | 0.999 |
| | Verified and Suspected | 6 | 0.6 | 9 | 0.9 | 15 | 0.442 |
| | Any Systemic Neoplasm ^b | | | | | | |
| Verified | 55 | 5.4 | 51 | 5.3 | 106 | 0.999 | |
| Verified and Suspected | 65 | 6.4 | 66 | 6.9 | 131 | 0.652 | |

TABLE H-1. (continued)

Unadjusted Analyses of Followup Participants with Verified and Suspected Neoplasms in the Baseline-Followup Interval by Group (Nonblacks and Blacks, Original Comparisons Only)

| Site | Neoplasm Behavior and Status | Group* | | | | Total** | p-Value*** |
|------------------|--|------------|---------|------------------------|---------|---------|------------|
| | | Ranch Hand | | Original Comparison | | | |
| | | Number** | Percent | Number** | Percent | | |
| All Neoplasms | Malignant, Benign, Uncertain Behavior, Unspecified Nature ^c | | | | | | |
| | Verified | 161 | 15.9 | 140 | 14.7 | 301 | 0.491 |
| | Verified and Suspected | 177 | 17.4 | 169 | 17.7 | 346 | 0.906 |

*Sample sizes: 1,016 Ranch Hands, 955 Original Comparisons.

**Number of participants.

***Fisher's exact test.

^aParticipant has one or more malignant, benign, or unspecified skin neoplasms.

^bParticipant has one or more malignant, or benign skin or systemic neoplasms.

^cParticipant has one or more malignant, benign, or unspecified systemic neoplasms.

TABLE H-2.

Unadjusted Analyses of Nonblack Followup Participants with Verified and Suspected Malignant Skin Neoplasms in the Baseline-Followup Interval by Cell Type and Group
(Original Comparisons Only)

| Cell Type | Status | Statistic* | Group** | | | Est. Relative Risk (95% C.I.) | p-Value |
|---|----------------------|-----------------------------|------------|---------------------|------|-------------------------------|---------|
| | | | Ranch Hand | Original Comparison | | | |
| Basal Cell Carcinoma | Verified | Number/% Total Neoplasms | 29 42 | 22 31 | 2.5% | 1.24 (0.71, 2.18) | 0.480 |
| | Verified & Suspected | Number/% Total Neoplasms | 36 53 | 36 46 | 4.0% | 0.94 (0.58, 1.50) | 0.811 |
| Squamous Cell Carcinoma | Verified | Number/% Total Neoplasms | 4 6 | 3 3 | 0.3% | 1.25 (0.28, 5.61) | 0.999 |
| | Verified & Suspected | Number/% Total Neoplasms | 4 6 | 3 3 | 0.3% | 1.25 (0.28, 5.61) | 0.999 |
| Melanoma | Verified | Number/% Total Neoplasms | 1 2 | 3 3 | 0.3% | 0.31 (0.03, 3.01) | 0.359 |
| | Verified & Suspected | Number/% Total Neoplasms | 1 2 | 4 4 | 0.4% | 0.23 (0.03, 2.10) | 0.204 |
| All Malignant Skin Neoplasms | Verified | Number/% Total Neoplasms | 37 56 | 31 41 | 3.5% | 1.13 (0.69, 1.83) | 0.711 |
| | Verified & Suspected | Number/% Total Neoplasms | 47 70 | 45 58 | 5.0% | 0.98 (0.64, 1.49) | 0.999 |
| Sun-Exposure Related Malignant Neoplasms* | Verified | Number/% Total Neoplasms | 32 47 | 25 33 | 2.8% | 1.21 (0.71, 2.06) | 0.504 |
| | Verified & Suspected | Number/% Total Neoplasms | 39 58 | 39 50 | 4.4% | 0.94 (0.59, 1.47) | 0.817 |

*Number and percent of participants; total number of malignant neoplasms of specified cell type.

**Number of participants -- 956 Ranch Hands, 897 Original Comparisons.

*Basal cell carcinoma, melanoma, and malignant epithelial neoplasms NOS.

TABLE H-3.

Association Between Baseline-Followup Interval Basal Cell Carcinoma Incidence
and the Covariates for Combined Followup Ranch Hand and Comparison Nonblack Participants

| Covariate | Covariate Category | Verified | | | Verified and Suspected | | |
|--|---------------------|----------|---------|---------|------------------------|---------|---------|
| | | Number* | Percent | p-Value | Number* | Percent | p-Value |
| Age | Born ≥ 1942 | 11 | 1.3 | 0.001 | 14 | 1.6 | <0.001 |
| | Born 1923-41 | 43 | 3.6 | | 61 | 5.1 | |
| | Born ≤ 1922 | 5 | 5.8 | | 9 | 10.3 | |
| Occupation | Officer | 31 | 3.7 | 0.047 | 47 | 5.5 | 0.003 |
| | Enlisted Flyer | 11 | 3.1 | | 14 | 3.9 | |
| | Enlisted Groundcrew | 17 | 1.8 | | 23 | 2.4 | |
| Total Lifetime Smoking (Pack-Years) | 0 | 16 | 2.6 | 0.023 | 21 | 3.4 | 0.005 |
| | >0-20 | 21 | 2.1 | | 28 | 2.8 | |
| | >20-40 | 12 | 3.1 | | 24 | 6.1 | |
| | >40 | 10 | 6.4 | | 11 | 7.0 | |
| Total Lifetime Alcohol Consumption (Drink-Years) | 0 | 4 | 2.8 | 0.980 | 5 | 3.6 | 0.800 |
| | >0-5 | 20 | 2.8 | | 27 | 3.8 | |
| | >5-30 | 18 | 2.8 | | 24 | 3.7 | |
| | >30-100 | 13 | 2.7 | | 24 | 5.0 | |
| | >100 | 4 | 3.9 | | 4 | 3.9 | |
| Ethnic Background ^a | A | 49 | 3.1 | 0.333 | 72 | 4.6 | 0.046 |
| | B | 8 | 1.9 | | 9 | 2.1 | |
| | C | 1 | 1.6 | | 1 | 1.6 | |
| | D | 0 | 0.0 | | 0 | 0.0 | |
| Skin Color | Dark | 0 | 0.0 | 0.156 | 0 | 0.0 | 0.232 |
| | Medium | 1 | 1.4 | | 2 | 2.7 | |
| | Pale | 3 | 1.0 | | 5 | 1.6 | |
| | Dark Peach | 43 | 3.4 | | 56 | 4.4 | |
| | Pale Peach | 12 | 2.3 | | 21 | 4.0 | |

TABLE H-3. (continued)
 Association Between Baseline-Followup Interval Basal Cell Carcinoma Incidence
 and the Covariates for Combined Followup Ranch Hand and Comparison Nonblack Participants

| Covariate | Covariate Category | Verified | | | Verified and Suspected | | |
|--|--------------------|----------|---------|---------|------------------------|---------|---------|
| | | Number* | Percent | p-Value | Number* | Percent | p-Value |
| Eye Color | Brown | 18 | 2.8 | 0.590 | 24 | 3.7 | 0.998 |
| | Hazel | 17 | 3.7 | | 18 | 4.0 | |
| | Green | 2 | 1.7 | | 5 | 4.2 | |
| | Grey | 2 | 2.2 | | 4 | 4.3 | |
| | Blue | 20 | 2.4 | | 33 | 3.9 | |
| Hair Color | Black | 11 | 2.5 | 0.152 | 16 | 3.6 | 0.040 |
| | Dark Brown | 25 | 2.4 | | 37 | 3.6 | |
| | Light Brown | 18 | 3.2 | | 24 | 4.3 | |
| | Red | 2 | 12.5 | | 3 | 18.8 | |
| | Blond | 3 | 2.8 | | 4 | 3.7 | |
| Residential History (Average Latitude) | ≥37° | 21 | 1.9 | 0.008 | 31 | 2.7 | 0.004 |
| | <37° | 38 | 3.7 | | 53 | 5.2 | |
| Skin Reaction to First 30 Min. of Sun Exposure | Burns | 7 | 2.8 | 0.001 | 11 | 4.5 | <0.001 |
| | Usually Burns | 24 | 5.6 | | 32 | 7.5 | |
| | Burns Mildly | 17 | 2.1 | | 22 | 2.7 | |
| | Rarely Burns | 11 | 1.6 | | 19 | 2.8 | |
| Skin Reaction to >2 Hrs. of Sun After First Exposure | Burns Painfully | 2 | 1.7 | <0.001 | 4 | 3.3 | 0.027 |
| | Burns | 21 | 6.2 | | 23 | 6.8 | |
| | Becomes Red | 22 | 2.1 | | 35 | 3.4 | |
| | No Reaction | 14 | 2.1 | | 22 | 3.3 | |
| Skin Reaction After Repeated Exposure to Sun | Freckles, No Tan | 0 | 0 | <0.001 | 1 | 2.2 | 0.001 |
| | Tans Mildly | 20 | 6.4 | | 25 | 8.0 | |
| | Tans Moderately | 22 | 2.2 | | 33 | 3.2 | |
| | Tans Deep Brown | 16 | 2.0 | | 24 | 3.1 | |

TABLE B-3. (continued)
Association Between Baseline-Followup Interval Basal Cell Carcinoma Incidence
and the Covariates for Combined Followup Ranch Hand and Comparison Nonblack Participants

| Covariate | Covariate Category | Verified | | | Verified and Suspected | | |
|-------------------------------|----------------------|-----------------|------------|---------|------------------------|------------|---------|
| | | Number* | Percent | p-Value | Number* | Percent | p-Value |
| Sun Reaction Index | Tends to Burn | 2 | 1.4 | <0.001 | 4 | 2.8 | <0.001 |
| | Mild Reaction | 27 | 6.0 | | 32 | 7.1 | |
| | Tends to Tan | 29 | 1.9 | | 47 | 3.0 | |
| Exposures to Carcinogens | Asbestos | Yes 10 No 49 | 2.2 2.9 | 0.519 | 17 67 | 3.7 3.9 | 0.999 |
| | Nonmedical x rays | Yes 17 No 42 | 3.4 2.5 | | 26 58 | 5.3 3.5 | |
| | Industrial Chemicals | Yes 28 No 31 | 2.5 3.0 | 0.511 | 40 44 | 3.6 4.2 | 0.437 |
| | Herbicides | Yes 40 No 19 | 3.2 2.1 | | 57 27 | 4.5 3.0 | |
| | Insecticides | Yes 40 No 19 | 3.1 2.2 | 0.281 | 55 29 | 4.2 3.4 | 0.365 |
| | Degreasing Chemicals | Yes 35 No 24 | 2.8 2.7 | | 47 37 | 3.7 4.1 | |
| Composite Carcinogen Exposure | | Yes 15 No 42 | 3.1 2.5 | 0.523 | 18 64 | 3.7 3.9 | 0.999 |

TABLE H-3. (continued)
Association Between Baseline-Followup Interval Basal Cell Carcinoma Incidence
and the Covariates for Combined Followup Ranch Hand and Comparison Nonblack Participants

| Covariate | Covariate Category | Verified | | | Verified and Suspected | | |
|------------------------------------|--------------------|----------|---------|---------|------------------------|---------|---------|
| | | Number* | Percent | p-Value | Number* | Percent | p-Value |
| Exposure to Individual Carcinogens | Anthracene | Yes 0 | 0.0 | 0.999 | 0 | 0.0 | 0.999 |
| | | No 59 | 2.7 | | 84 | 3.9 | |
| | Arsenic | Yes 2 | 4.9 | 0.301 | 3 | 7.3 | 0.206 |
| | | No 56 | 2.6 | | 80 | 3.8 | |
| | Benzene | Yes 4 | 5.4 | 0.140 | 5 | 6.8 | 0.207 |
| | | No 55 | 2.6 | | 79 | 3.8 | |
| | Benzidine | Yes 1 | 9.1 | 0.263 | 1 | 9.1 | 0.354 |
| | | No 58 | 2.7 | | 83 | 3.9 | |
| | Chromates | Yes 3 | 3.6 | 0.484 | 4 | 4.8 | 0.558 |
| | | No 54 | 2.6 | | 78 | 3.8 | |
| | Coal Tar | Yes 1 | 1.5 | 0.999 | 2 | 2.9 | 0.999 |
| | | No 58 | 2.8 | | 82 | 3.9 | |
| | Creosote | Yes 6 | 3.8 | 0.441 | 7 | 4.4 | 0.669 |
| | | No 53 | 2.6 | | 77 | 3.8 | |
| | Aminodiphenyl | Yes 0 | 0.0 | 0.999 | 0 | 0.0 | 0.999 |
| | | No 58 | 2.7 | | 83 | 3.9 | |
| | Chloromethyl Ether | Yes 1 | 4.8 | 0.442 | 1 | 4.8 | 0.566 |
| | | No 58 | 2.7 | | 83 | 3.9 | |
| | Mustard Gas | Yes 0 | 0.0 | 0.999 | 0 | 0.0 | 0.999 |
| | | No 59 | 2.7 | | 84 | 3.9 | |

TABLE H-3. (continued)

Association Between Baseline-Followup Interval Basal Cell Carcinoma Incidence
and the Covariates for Combined Followup Ranch Hand and Comparison Nonblack Participants

| Covariate | Covariate Category | Verified | | | Verified and Suspected | | |
|---|-----------------------|----------|---------|---------|------------------------|------------|---------|
| | | Number* | Percent | p-Value | Number* | Percent | p-Value |
| Exposure to Individual Carcinogens (continued) | Naphthylamine | Yes 3 | 5.8 | 0.161 | 4 79 | 7.7 3.7 | 0.136 |
| | | No 55 | 2.6 | | | | |
| | Cutting Oils | Yes 9 | 4.0 | 0.200 | 12 72 | 5.3 3.7 | 0.271 |
| | | No 50 | 2.6 | | | | |
| | Trichloroethylene | Yes 4 | 2.2 | 0.814 | 6 78 | 3.3 3.9 | 0.842 |
| | | No 55 | 2.8 | | | | |
| | Ultraviolet Light | Yes 2 | 4.6 | 0.339 | 2 82 | 4.6 3.9 | 0.688 |
| | | No 57 | 2.7 | | | | |
| | Vinyl Chloride | Yes 0 | 0.0 | 0.999 | 1 83 | 3.2 3.9 | 0.999 |
| | | No 59 | 2.8 | | | | |

*Number of participants with basal cell carcinoma.

*Ethnic Background:

- A - English, Welsh, Scottish, Irish.
- B - Scandinavian, German, Polish, Russian, other Slavic, Jewish, French.
- C - Spanish, Italian, Greek.
- D - Mexican, American Indian, Asian.

TABLE H-4.

Association Between Baseline-Pollovup Interval Sun Exposure-Related Skin Malignancy Incidence
and the Covariates for Combined Pollovup Ranch Hand and Comparison Nonblack Participants

| Covariate | Covariate Category | Verified | | | Verified and Suspected | | |
|---|-----------------------|----------|---------|---------|------------------------|---------|---------|
| | | Number* | Percent | p-Value | Number* | Percent | p-Value |
| Age | Born ≥1942 | 14 | 1.6 | 0.004 | 19 | 2.2 | <0.001 |
| | Born 1923-41 | 46 | 3.8 | | 64 | 5.4 | |
| | Born ≤1922 | 5 | 5.8 | | 9 | 10.3 | |
| Occupation | Officer | 33 | 3.9 | 0.077 | 50 | 5.9 | 0.006 |
| | Enlisted Flyer | 12 | 3.3 | | 15 | 4.2 | |
| | Enlisted Groundcrew | 20 | 2.1 | | 27 | 2.8 | |
| Total Lifetime Smoking (Pack-Years) | 0 | 19 | 3.1 | 0.012 | 24 | 3.9 | 0.007 |
| | >0-20 | 22 | 2.2 | | 31 | 3.1 | |
| | >20-40 | 13 | 3.3 | | 25 | 6.4 | |
| | >40 | 11 | 7.0 | | 12 | 7.6 | |
| Total Lifetime Alcohol Consumption (Drink-Years) | 0 | 4 | 2.8 | 0.858 | 5 | 3.6 | 0.736 |
| | >0-5 | 22 | 3.1 | | 29 | 4.0 | |
| | >5-30 | 18 | 2.8 | | 26 | 4.0 | |
| | >30-100 | 15 | 3.1 | | 26 | 5.4 | |
| | >100 | 5 | 4.8 | | 5 | 4.8 | |
| Ethnic Background | A | 54 | 3.4 | 0.213 | 78 | 4.9 | 0.036 |
| | B | 8 | 1.9 | | 10 | 2.4 | |
| | C | 1 | 1.6 | | 1 | 1.6 | |
| | D | 0 | 0.0 | | 0 | 0.0 | |
| Skin Color | Dark | 0 | 0.0 | 0.116 | 0 | 0.0 | 0.213 |
| | Medium | 1 | 1.4 | | 2 | 2.7 | |
| | Pale | 4 | 1.3 | | 6 | 2.0 | |
| | Dark Peach | 48 | 3.8 | | 62 | 4.9 | |
| | Pale Peach | 12 | 2.3 | | 22 | 4.2 | |

TABLE H-4. (continued)

Association Between Baseline-Followup Interval Sun Exposure-Related Skin Malignancy Incidence
and the Covariates for Combined Followup Ranch Hand and Comparison Nonblack Participants

| Covariate | Covariate Category | Verified | | | Verified and Suspected | | |
|---|-----------------------|----------|---------|---------|------------------------|---------|---------|
| | | Number* | Percent | p-Value | Number* | Percent | p-Value |
| Eye Color | Brown | 20 | 3.1 | 0.461 | 27 | 4.2 | 0.999 |
| | Hazel | 19 | 4.2 | | 20 | 4.4 | |
| | Green | 2 | 1.7 | | 5 | 4.2 | |
| | Grey | 2 | 2.2 | | 4 | 4.3 | |
| | Blue | 22 | 2.6 | | 36 | 4.2 | |
| Hair Color | Black | 12 | 2.7 | 0.171 | 17 | 3.9 | 0.051 |
| | Dark Brown | 27 | 2.6 | | 40 | 3.9 | |
| | Light Brown | 20 | 3.6 | | 26 | 4.6 | |
| | Red | 2 | 12.5 | | 3 | 18.8 | |
| | Blond | 4 | 3.7 | | 6 | 5.6 | |
| Residential History (Average Latitude) | >37° | 24 | 2.1 | 0.011 | 34 | 3.0 | 0.003 |
| | <37° | 41 | 4.0 | | 58 | 5.7 | |
| Skin Reaction to First 30 Min. of Sun Exposure | Burns | 8 | 3.2 | <0.001 | 13 | 5.3 | <0.001 |
| | Usually Burns | 26 | 6.1 | | 34 | 7.9 | |
| | Burns Mildly | 20 | 2.5 | | 26 | 3.2 | |
| | Rarely Burns | 11 | 1.6 | | 19 | 2.8 | |
| Skin Reaction to >2 Hrs. of Sun After First Exposure | Burns Painfully | 4 | 3.3 | 0.001 | 6 | 5.0 | 0.016 |
| | Burns | 22 | 6.5 | | 25 | 7.4 | |
| | Becomes Red | 24 | 2.3 | | 38 | 3.6 | |
| | No Reaction | 15 | 2.3 | | 23 | 3.5 | |
| Skin Reaction After Repeated Exposure to Sun | Freckles, No Tan | 0 | 0 | <0.001 | 1 | 2.2 | <0.001 |
| | Tans Mildly | 22 | 7.0 | | 27 | 8.6 | |
| | Tans Moderately | 23 | 2.3 | | 35 | 3.4 | |
| | Tans Deep Brown | 19 | 2.4 | | 28 | 3.6 | |

TABLE H-4. (continued)

Association Between Baseline-Followup Interval Sun Exposure-Related Skin Malignancy Incidence
and the Covariates for Combined Followup Ranch Hand and Comparison Nonblack Participants

| Covariate | Covariate Category | Verified | | | Verified and Suspected | | |
|----------------------------------|-----------------------|-----------------|------------|---------|------------------------|------------|---------|
| | | Number* | Percent | p-Value | Number* | Percent | p-Value |
| Sun Reaction Index | Tends to Burn | 4 | 2.8 | <0.001 | 6 | 4.1 | <0.001 |
| | Mild Reaction | 28 | 6.2 | | 34 | 7.5 | |
| | Tends to Tan | 32 | 2.1 | | 51 | 3.3 | |
| Exposures to Carcinogens | Asbestos | Yes 10 No 55 | 2.2 3.2 | 0.283 | 17 75 | 3.7 4.4 | 0.602 |
| | Nonmedical X Rays | Yes 18 No 47 | 3.6 2.8 | 0.367 | 27 65 | 5.5 3.9 | 0.129 |
| | Industrial Chemicals | Yes 33 No 32 | 2.9 3.1 | 0.900 | 45 47 | 4.0 4.5 | 0.594 |
| | Herbicides | Yes 43 No 22 | 3.4 2.4 | 0.203 | 61 31 | 4.8 3.4 | 0.130 |
| | Insecticides | Yes 42 No 23 | 3.2 2.7 | 0.523 | 58 34 | 4.4 4.0 | 0.664 |
| | Degreasing Chemicals | Yes 37 No 28 | 2.9 3.1 | 0.899 | 50 42 | 4.0 4.6 | 0.451 |
| Composite Carcinogen Exposure | | Yes 15 No 48 | 3.1 2.9 | 0.879 | 18 72 | 3.7 4.4 | 0.608 |

TABLE H-4. (continued)

Association Between Baseline-Pollup Interval Sun Exposure-Related Skin Malignancy Incidence
and the Covariates for Combined Followup Ranch Hand and Comparison Nonblack Participants

| Covariate | Covariate Category | Verified | | | Verified and Suspected | | |
|--|-----------------------|----------------|------------|---------|------------------------|------------|---------|
| | | Number* | Percent | p-Value | Number* | Percent | p-Value |
| Exposure to Individual Carcinogens | Anthracene | Yes 0 No 65 | 0.0 3.0 | 0.999 | 0 92 | 0.0 4.3 | 0.999 |
| | Arsenic | Yes 2 No 62 | 4.9 2.9 | 0.343 | 3 88 | 7.3 4.1 | 0.246 |
| | Benzene | Yes 4 No 61 | 5.4 2.9 | 0.280 | 5 87 | 6.8 4.2 | 0.241 |
| | Benzidine | Yes 1 No 64 | 9.1 3.0 | 0.285 | 1 91 | 9.1 4.2 | 0.380 |
| | Chromates | Yes 3 No 60 | 3.6 2.9 | 0.734 | 4 86 | 4.8 4.1 | 0.777 |
| | Coal Tar | Yes 1 No 64 | 1.5 3.1 | 0.721 | 2 90 | 2.9 4.3 | 0.999 |
| | Creosote | Yes 6 No 59 | 3.8 2.9 | 0.473 | 7 85 | 4.4 4.2 | 0.839 |
| | Aminodiphenyl | Yes 0 No 64 | 0.0 3.0 | 0.999 | 0 91 | 0.0 4.2 | 0.999 |
| | Chloromethyl Ether | Yes 1 No 64 | 4.8 3.0 | 0.475 | 1 91 | 4.8 4.3 | 0.600 |
| | Mustard Gas | Yes 0 No 65 | 0.0 3.0 | 0.999 | 0 92 | 0.0 4.3 | 0.999 |

TABLE H-4. (continued)

Association Between Baseline-Pollup Interval Sun Exposure-Related Skin Malignancy Incidence
and the Covariates for Combined Followup Ranch Hand and Comparison Nonblack Participants

| Covariate | Covariate Category | Verified | | | Verified and Suspected | | |
|---|-----------------------|----------|---------|---------|------------------------|------------|---------|
| | | Number* | Percent | p-Value | Number* | Percent | p-Value |
| Exposure to Individual Carcinogens (continued) | Naphthylamine | Yes 3 | 5.8 | 0.197 | 4 87 | 7.7 4.1 | 0.277 |
| | | No 61 | 2.9 | | | | |
| | Cutting Oils | Yes 9 | 4.0 | 0.406 | 12 80 | 5.3 4.1 | 0.384 |
| | | No 56 | 2.9 | | | | |
| | Trichloroethylene | Yes 4 | 2.2 | 0.653 | 6 86 | 3.3 4.4 | 0.701 |
| | | No 61 | 3.1 | | | | |
| | Ultraviolet Light | Yes 2 | 4.6 | 0.384 | 2 90 | 4.6 4.3 | 0.711 |
| | | No 63 | 3.0 | | | | |
| | Vinyl Chloride | Yes 0 | 0.0 | 0.999 | 1 91 | 3.2 4.3 | 0.999 |
| | | No 65 | 3.1 | | | | |

*Number of participants with sun exposure-related skin malignancies.

*Ethnic Background:

- A - English, Welsh, Scottish, Irish.
- B - Scandinavian, German, Polish, Russian, other Slavic, Jewish, French.
- C - Spanish, Italian, Greek.
- D - Mexican, American Indian, Asian.

TABLE H-5.

**Summary Results of Main Effects Models for Selection
of Covariates for Basal Cell Carcinomas in the Baseline-Followup Interval**

| Covariate | Category | Basal Cell Carcinoma in Baseline-Followup Interval | |
|--|--|---|----------------------|
| | | p-Value | |
| | | Model 1 ^a | Model 2 ^b |
| Group | Ranch Hand, Comparison | 0.264 | 0.259 |
| Age | Born ≥ 1942 , 1923-1941, ≤ 1922 | 0.001 | 0.002 |
| Occupation | Officer, Enlisted Flyer, Enlisted Groundcrew | 0.683 | 0.609 |
| Lifetime Smoking | 0-20, >20-40, >40 Pack-years | 0.091 | 0.096 |
| Lifetime Alcohol | 0-30, >30 | 0.743 | 0.819 |
| Ethnic Background ^c | A, Not A | 0.391 | 0.425 |
| Skin Color | Peach, Not Peach | 0.084 | 0.055 |
| Hair Color | Blond or Red, Other | 0.880 | 0.761 |
| Reaction of Skin to 30 Minutes Sun | Burns, Usually Burns, Other | 0.195 | -- |
| Reaction of Skin to >2 Hours of Sun | Burns Painfully, Burns, Other | 0.007 | -- |
| Reaction of Skin to Repeated Sun Exposure | Freckles With no Tan, Tans Easily, Other | <0.001 | -- |
| Sun-Reaction Index | Burns With Freckles, Intermediate Reaction, Tans Easily | -- | <0.001 |
| Residential History | <37° N latitude, $\geq 37^\circ$ N latitude | 0.006 | 0.008 |

^aModel includes three reactions of skin to sun variables.

^bModel includes sun-reaction index.

^cEthnic background: A - English, Welsh, Scottish, Irish.

TABLE H-6.

Adjusted Analyses of Nonblack Followup Participants for Malignant
Skin Neoplasm Incidence During Baseline-Followup Interval
(Original Comparisons Only)

| Variable | Status | Adj. Relative Risk (95% C.I.) | p-Value | Covariate Remarks* |
|--------------------------------|-------------------------|----------------------------------|---------|---|
| Basal Cell Carcinoma | Verified | 1.46 (0.82,2.61) | 0.198 | AGE (p<0.001) LAT (p=0.015) SUNREAC (p=0.001) GRP*SUNREAC (marginal: p=0.051) |
| | Verified & Suspected | **** | **** | GRP*SUNREAC (p=0.007) AGE (p<0.001) LAT (p=0.006) |
| Sun-Exposure Skin Neoplasms | Verified | **** | **** | GRP*SKIN (p=0.036) AGE (p<0.001) SUNREAC (p=0.003) LAT (p=0.015) |
| | Verified & Suspected | **** | **** | GRP*SUNREAC (p=0.030) SKIN*SUNREAC (p=0.042) AGE (p<0.001) LAT (p=0.008) |

*Abbreviations:

LAT: average lifetime residential latitude
 SUNREAC: sun reaction index
 GRP: group
 OCC: occupation
 SKIN: skin color

****Group-by-covariate interactions--adjusted relative, confidence interval, and p-value are not presented.

TABLE H-7.

Summary of Group-by-Covariate Interactions for
Malignant Skin Neoplasms in the Baseline-Followup Interval
(Nonblacks Only)

| Variable Interaction | Stratification | Statistic | Group | | | | Adj. Relative Risk (95% C.I.) | p-Value |
|--|----------------|-----------|------------|---------|------------|---------|-------------------------------|---------|
| | | | Ranch Hand | | Comparison | | | |
| | | | Number | Percent | Number | Percent | | |
| Officer | n | | 372 | | 475 | | | |
| | Yes | | 14 | 3.8 | 16 | 3.4 | 1.14 (0.54, 2.40) | 0.726 |
| | No | | 358 | 96.2 | 459 | 96.6 | | |
| Basal Cell Group-by-Occupation (Verified Only) | n | | 166 | | 193 | | | |
| | Yes | | 9 | 5.4 | 2 | 1.0 | 6.50 (1.36, 31.01) | 0.019 |
| | No | | 157 | 94.6 | 191 | 99.0 | | |
| Enlisted Groundcrew | n | | 416 | | 539 | | | |
| | Yes | | 6 | 1.4 | 11 | 2.0 | 0.81 (0.29, 2.23) | 0.680 |
| | No | | 410 | 98.6 | 528 | 98.0 | | |

TABLE H-7. (continued)

Summary of Group-by-Covariate Interactions for
Malignant Skin Neoplasms in the Baseline-Followup Interval
(Nonblacks Only)

| Variable Interaction | Stratification | Statistic | Group | | | | Adj. Relative Risk (95% C.I.) | p-Value |
|--|----------------|-----------------------|------------|---------|------------|---------|-------------------------------|--------------------|
| | | | Ranch Hand | | Comparison | | | |
| | | | Number | Percent | Number | Percent | | |
| Burns Easily | n Yes No | | 68 | | 77 | | | |
| | | | 0 | 0 | 4 | 5.2 | -- ^a | 0.121 ^b |
| | | | 68 | 100 | 73 | 94.8 | | |
| Basal Cell Group-by-Carcinoma Sun Reaction (Verified Index Plus Suspected) | n Yes No | Intermediate Reaction | 192 | | 262 | | | |
| | | | 17 | 8.9 | 15 | 5.7 | 1.76 (0.84, 3.69) | 0.134 |
| | | | 175 | 91.1 | 247 | 94.3 | | |
| Tans Easily | n Yes No | | 693 | | 867 | | | |
| | | | 19 | 2.7 | 28 | 3.2 | 0.90 (0.50, 1.64) | 0.731 |
| | | | 674 | 97.3 | 839 | 96.8 | | |

^aAdjusted relative risk not calculated because of a zero cell count.

^bFisher's exact test.

TABLE H-8.

Summary of Group-by-Covariate Interactions for
Malignant Skin Neoplasms in the Baseline-Followup Interval
(Original Comparisons Only*)

| Variable Interaction | Stratification | Statistic | Group | | | | Adj. Relative Risk (95% C.I.) | p-Value |
|--|----------------|-----------|------------|---------|---------------------|---------|-------------------------------|--------------------|
| | | | Ranch Hand | | Original Comparison | | | |
| | | | Number | Percent | Number | Percent | | |
| | Burns Easily | n | 68 | | 56 | | | |
| | | Yes | 0 | 0 | 2 | 3.6 | — ^a | 0.202 ^b |
| | | No | 68 | 100 | 54 | 96.4 | | |
| Basal Cell Group-by-Carcinoma Sun Reaction (Verified Index Only) | Intermediate | n | 192 | | 186 | | | |
| | | Yes | 15 | 7.8 | 6 | 3.2 | 2.81 (1.05, 7.55) | 0.040 |
| | | No | 177 | 92.2 | 180 | 96.8 | | |
| | Tans Easily | n | 694 | | 653 | | | |
| | | Yes | 14 | 2.0 | 13 | 2.0 | 1.13 (0.52, 2.43) | 0.758 |
| | | No | 680 | 98.0 | 640 | 98.0 | | |

TABLE H-8. (continued)

Summary of Group-by-Covariate Interactions for
Malignant Skin Neoplasms in the Baseline-Followup Interval
(Original Comparisons Only*)

| Variable | Interaction | Stratification | Statistic | Group | | | | Adj. Relative Risk (95% C.I.) | p-Value |
|--|--------------|----------------|-----------|------------|---------|------------------------|-------------------|----------------------------------|---------|
| | | | | Ranch Hand | | Original Comparison | | | |
| | | | | Number | Percent | Number | Percent | | |
| Basal Cell Carcinoma (Verified Plus Suspected) | Burns Easily | n | 68 | | 55 | | | | |
| | | Yes | 0 | 0 | 4 | 7.3 | -- ^a | 0.038 ^b | |
| | | No | 68 | 100 | 51 | 92.7 | | | |
| | Intermediate | n | 192 | | 185 | | | | |
| | | Yes | 17 | 8.9 | 8 | 4.3 | 2.38 (0.98, 5.76) | 0.055 | |
| | | No | 175 | 91.1 | 177 | 95.7 | | | |
| | Tans Easily | n | 694 | | 646 | | | | |
| | | Yes | 19 | 2.7 | 23 | 3.6 | 0.86 (0.46, 1.60) | 0.627 | |
| | | No | 675 | 97.3 | 623 | 96.4 | | | |

TABLE H-8. (continued)

Summary of Group-by-Covariate Interactions for
Malignant Skin Neoplasms in the Baseline-Followup Interval
(Original Comparisons Only*)

| Variable | Interaction | Stratification | Statistic | Group | | | | | | Adj. Relative Risk (95% C.I.) | p-Value |
|--|-------------|----------------|-----------|------------|---------|---------------------|---------|--------|--------------|-------------------------------|---------|
| | | | | Ranch Hand | | Original Comparison | | | | | |
| | | | | Number | Percent | Number | Percent | Number | Percent | | |
| Sun Exposure Related Neoplasms (Verified Only) | Peach | n | Yes | 768 | 4.0 | 744 | 2.7 | 0.20 | (0.02, 1.80) | 0.150 | |
| | | | No | 31 | 96.0 | 20 | 97.3 | | | | |
| | | | | 737 | | 724 | | | | | |
| Group-by-Skin Color | Not Peach | n | Yes | 185 | 0.5 | 150 | 2.7 | 1.70 | (0.95, 3.04) | 0.073 | |
| | | | No | 1 | 99.5 | 4 | 97.3 | | | | |
| | | | | 184 | | 146 | | | | | |

TABLE H-8. (continued)

Summary of Group-by-Covariate Interactions for
Malignant Skin Neoplasms in the Baseline-Followup Interval
(Original Comparisons Only*)

| Variable | Interaction | Stratification | Statistic | Group | | | | Adj. Relative Risk (95% C.I.) | p-Value |
|--|--------------|----------------|-----------|------------|---------|---------------------|--------------|-------------------------------|---------|
| | | | | Ranch Hand | | Original Comparison | | | |
| | | | | Number | Percent | Number | Percent | | |
| Sun Exposure Related Neoplasms (Verified Plus Suspected) | Burns Easily | n | | | | | | | |
| | | Yes | 68 | 2.9 | 56 | 7.1 | 0.47 | 0.401 | |
| | | No | 2 | 97.1 | 4 | 92.9 | | | |
| | Intermediate | n | | | | | | | |
| | | Yes | 192 | 9.4 | 186 | 4.3 | 2.74 | 0.025 | |
| | | No | 18 | 90.6 | 8 | 95.7 | (1.14, 6.63) | | |
| Tans Easily | n | | | | | | | | |
| | Yes | 693 | 2.7 | 652 | 4.0 | 0.75 | 0.343 | | |
| | No | 19 | 97.3 | 26 | 96.0 | (0.41, 1.37) | | | |

*Blacks excluded.

^aAdjusted relative risk not calculated because of a zero cell count.^bFisher's exact test.

TABLE H-9.

Followup Participants With Verified Malignant Systemic
Neoplasms in Baseline-Followup Interval by Group
(Original Comparisons Only)

| Site | Group | | Total |
|-------------------------------------|-------------------|---------------------|----------|
| | Ranch Hand | Original Comparison | |
| Oral Cavity and Pharynx | 2 ^{a, b} | 0 | 2 |
| Thyroid Gland | 0 | 1 | 1 |
| Bronchus and Lung | 1 | 0 | 1 |
| Colon | 0 | 3 ^{c, d} | 3 |
| Kidney and Bladder | 2 | 1 | 3 |
| Prostate | 1 | 1 | 2 |
| Testicles | 1 | 0 | 1 |
| Connective and Other Soft Tissue | <u>1</u> | <u>0</u> | <u>1</u> |
| Total | 8 | 6 | 14 |

^aIncludes one Ranch Hand with separate malignancies of tongue and epiglottis and also malignant neoplasm of bone.

^bIncludes one Ranch Hand with separate malignant neoplasms of tongue and oropharynx and secondary malignant neoplasm of other site.

^cIncludes one comparison with secondary malignant neoplasms of liver and bone and bone marrow.

^dIncludes one comparison with secondary malignant neoplasm of liver.

TABLE H-10.

Unadjusted Analyses of Followup Participants with Verified and Suspected
Malignant Systemic Neoplasms in the Baseline-Followup Interval by Group
(Original Comparisons Only)

| Status | Statistic | Group | | | | Est. Relative Risk (95% C.I.) | p-Value |
|----------------------|-----------------|------------|------|------------------------|------|----------------------------------|---------|
| | | Ranch Hand | Hand | Original Comparison | | | |
| Verified | Number/% | 8 | 0.8% | 6 | 0.6% | 1.26 (0.43,3.63) | 0.791 |
| | Total Neoplasms | 12 | | 9 | | | |
| Verified & Suspected | Number/% | 12 | 1.2% | 11 | 1.2% | 1.03 (0.45,2.34) | 0.999 |
| | Total Neoplasms | 23 | | 14 | | | |

TABLE H-11.

Association Between Baseline-Followup Interval Incidence of All Malignant Systemic
Neoplasms Combined and the Covariates for the Combined Followup Ranch Hand and Comparison Groups

| Covariate | Covariate Category | Verified | | | Verified and Suspected | | |
|---|-----------------------|----------|---------|---------|------------------------|---------|---------|
| | | Number* | Percent | p-Value | Number* | Percent | p-Value |
| Age | Born ≥ 1942 | 1 | 0.1 | <0.001 | 4 | 0.4 | 0.001 |
| | Born 1923-41 | 10 | 0.8 | | 16 | 1.3 | |
| | Born ≤ 1922 | 4 | 4.6 | | 4 | 4.6 | |
| Race | Nonblack | 15 | 0.7 | 0.999 | 23 | 1.1 | 0.999 |
| | Black | 0 | 0.0 | | 1 | 0.7 | |
| Occupation | Officer | 10 | 1.2 | 0.056 | 13 | 1.5 | 0.193 |
| | Enlisted Flyer | 2 | 0.5 | | 4 | 1.0 | |
| | Enlisted Groundcrew | 3 | 0.3 | | 7 | 0.7 | |
| Total Lifetime Smoking (Pack-Years) | 0 | 2 | 0.3 | 0.220 | 4 | 0.6 | 0.374 |
| | >0-20 | 6 | 0.6 | | 11 | 1.0 | |
| | >20-40 | 5 | 1.2 | | 7 | 1.7 | |
| | >40 | 2 | 1.3 | | 2 | 1.3 | |
| Total Lifetime Alcohol Consumption (Drink-Years) | 0 | 0 | 0 | 0.082 | 1 | 0.7 | 0.233 |
| | >0-5 | 2 | 0.3 | | 5 | 0.7 | |
| | >5-30 | 3 | 0.4 | | 5 | 0.7 | |
| | >30-100 | 7 | 1.4 | | 9 | 1.8 | |
| | >100 | 1 | 0.9 | | 2 | 1.9 | |
| Exposures to Carcinogens | Asbestos | Yes 3 | 0.6 | 0.999 | 5 | 1.0 | 0.999 |
| | | No 12 | 0.7 | | 19 | 1.1 | |
| Nonmedical X Rays | Yes 5 | 0.9 | 0.364 | 0.049 | 10 | 1.9 | 0.049 |
| | No 10 | 0.6 | | | 14 | 0.8 | |

TABLE H-11. (continued)
 Association Between Baseline-Followup Interval Incidence of All Malignant Systemic
 Neoplasms Combined and the Covariates for the Combined Followup Ranch Hand and Comparison Groups

| Covariate | Covariate Category | Verified | | | Verified and Suspected | | |
|--|-----------------------|----------|---------|---------|------------------------|---------|---------|
| | | Number* | Percent | p-Value | Number* | Percent | p-Value |
| Exposures to Carcinogens (continued) | Industrial Chemicals | Yes | 5 | 0.4 | 11 | 0.9 | 0.682 |
| | | No | 10 | 0.9 | 13 | 1.2 | |
| | Herbicides | Yes | 9 | 0.7 | 14 | 1.1 | 0.999 |
| | | No | 6 | 0.6 | 10 | 1.0 | |
| | Insecticides | Yes | 4 | 0.3 | 10 | 0.7 | 0.091 |
| | | No | 11 | 1.2 | 14 | 1.5 | |
| Composite Carcinogen Exposure | Degreasing Chemicals | Yes | 6 | 0.5 | 14 | 1.0 | 0.999 |
| | | No | 9 | 0.9 | 10 | 1.0 | |
| | | Yes | 4 | 0.8 | 5 | 1.0 | 0.999 |
| | | No | 11 | 0.6 | 18 | 1.0 | |
| | Anthracene | Yes | 0 | 0.0 | 0 | 0.0 | 0.999 |
| | | No | 15 | 0.7 | 24 | 1.0 | |
| Exposure to Individual Carcinogens | Arsenic | Yes | 0 | 0 | 2 | 4.8 | 0.069 |
| | | No | 15 | 0.7 | 22 | 1.0 | |
| | Benzene | Yes | 1 | 1.2 | 1 | 1.2 | 0.587 |
| | | No | 14 | 0.6 | 23 | 1.0 | |
| | Benzidine | Yes | 1 | 7.1 | 1 | 7.1 | 0.131 |
| | | No | 14 | 0.6 | 22 | 1.0 | |

TABLE H-11. (continued)

Association Between Baseline-Followup Interval Incidence of All Malignant Systemic Neoplasms Combined and the Covariates for the Combined Followup Ranch Hand and Comparison Groups

| Covariate | Covariate Category | Verified | | | Verified and Suspected | | |
|--|--------------------|----------|---------|---------|------------------------|---------|---------|
| | | Number* | Percent | p-Value | Number* | Percent | p-Value |
| Exposure to Individual Carcinogens (continued) | Chromates | Yes 2 | 2.3 | 0.110 | 2 | 2.3 | 0.232 |
| | | No 13 | 0.6 | | 22 | 1.0 | |
| Coal Tar | | Yes 2 | 2.7 | 0.079 | 2 | 2.7 | 0.175 |
| | | No 13 | 0.6 | | 22 | 1.0 | |
| Creosote | | Yes 1 | 0.6 | 0.999 | 3 | 1.8 | 0.240 |
| | | No 14 | 0.7 | | 21 | 1.0 | |
| Aminodiphenyl | | Yes 0 | 0 | 0.999 | 1 | 16.7 | 0.061 |
| | | No 15 | 0.7 | | 23 | 1.0 | |
| Chloromethyl Ether | | Yes 1 | 4.4 | 0.140 | 2 | 8.7 | 0.023 |
| | | No 14 | 0.6 | | 22 | 1.0 | |
| Mustard Gas | | Yes 0 | 0 | 0.999 | 1 | 11.1 | 0.090 |
| | | No 15 | 0.7 | | 23 | 1.0 | |
| Naphthylamine | | Yes 2 | 3.6 | 0.050 | 3 | 5.4 | 0.019 |
| | | No 13 | 0.6 | | 21 | 0.9 | |
| Cutting Oils | | Yes 3 | 1.2 | 0.204 | 5 | 2.1 | 0.100 |
| | | No 12 | 0.6 | | 19 | 0.9 | |
| Trichloroethylene | | Yes 3 | 1.5 | 0.135 | 4 | 2.0 | 0.149 |
| | | No 12 | 0.6 | | 20 | 1.0 | |

TABLE H-11. (continued)

Association Between Baseline-Followup Interval Incidence of All Malignant Systemic Neoplasms Combined and the Covariates for the Combined Followup Ranch Hand and Comparison Groups

| Covariate | Covariate Category | Verified | | | Verified and Suspected | | |
|--|--------------------|----------|---------|---------|------------------------|---------|---------|
| | | Number* | Percent | p-Value | Number* | Percent | p-Value |
| Exposure to Individual Carcinogens (continued) | Ultraviolet Light | Yes 1 | 2.0 | 0.286 | 1 | 2.0 | 0.417 |
| | | No 14 | 0.6 | | 23 | 1.0 | |
| | Vinyl Chloride | Yes 0 | 0.0 | 0.999 | 1 | 3.0 | 0.294 |
| | | No 15 | 0.7 | | 23 | 1.0 | |

*Number of participants with malignant systemic neoplasms.

TABLE H-12.

Adjusted Analyses of Followup Participants for the Incidence of All
Malignant Systemic Neoplasms During the Baseline-Followup Interval
(Original Comparisons Only)

| Variable | Adj. Relative Risk (95% C.I.) | p-Value | Covariate Remarks |
|--|----------------------------------|---------|---|
| Systemic Neoplasms (Verified) | 1.47 (0.50,4.33) | 0.481 | AGE (p<0.001) |
| Systemic Neoplasms (Verified & Suspected) | **** | **** | GRP*OCC (p=0.028) AGE (p<0.001) RACE*PACKYR (p=0.032) |

****Group-by-covariate interaction--adjusted relative risk, confidence interval, and p-value not presented.

TABLE H-13.

**Summary of Group-by-Occupation Interaction for All Malignant
Systemic Neoplasms (Verified Plus Suspected) During the Baseline-Followup Interval**

| Variable | Interaction | Stratification | Statistic | Group | | | | | | Adj. Relative Risk (95% C.I.) | p-Value |
|---|---------------------|----------------|-----------|------------|---------|------------|---------|------------------|--------------------|-------------------------------|---------|
| | | | | Ranch Hand | | Comparison | | | | | |
| | | | | Number | Percent | Number | Percent | Number | Percent | | |
| Systemic Cancer (Verified Plus Suspected) | Officer | n | | 380 | | 484 | | | | | |
| | | Yes | | 5 | 1.3 | 8 | 1.7 | 0.79 (0.25,2.44) | 0.679 | | |
| | | No | | 375 | 98.7 | 476 | 98.3 | | | | |
| | | n | | 175 | | 209 | | | | | |
| | Enlisted Flyer | Yes | | 4 | 2.3 | 0 | 0 | --- | 0.042 ^b | | |
| | | No | | 171 | 97.7 | 209 | 100 | | | | |
| | Enlisted Groundcrew | n | | 457 | | 598 | | | | | |
| | | Yes | | 3 | 0.7 | 4 | 0.7 | 0.93 (0.20,4.26) | 0.923 | | |
| | | No | | 454 | 99.3 | 594 | 99.3 | | | | |
| | | | | | | | | | | | |

^aAdjusted relative risk not calculated because of a zero cell.

^bFisher's exact test.

TABLE H-14.

Summary of Group by Occupation Interaction for All Malignant Systemic
Neoplasms (Verified Plus Suspected) During the Baseline-Followup Interval
(Original Comparisons Only)

| Variable | Interaction | Stratification | Statistic | Group | | | | | | Adj. Relative Risk (95% C.I.) | p-Value |
|---|---------------------|---------------------|-----------|------------|---------|---------------------|---------|-------------------|--------------------|-------------------------------|---------|
| | | | | Ranch Hand | | Original Comparison | | | | | |
| | | | | Number | Percent | Number | Percent | Number | Percent | | |
| All Systemic Cancer (Verified Plus Suspected) | Group-by-Occupation | Officers | n | 380 | | 350 | | | | | |
| | | | Yes | 5 | 1.3 | 7 | 2.0 | 0.72 (0.22, 2.30) | 0.577 | | |
| | | | No | 375 | 98.7 | 343 | 98.0 | | | | |
| | Enlisted Flyers | Enlisted Flyers | n | 175 | | 174 | | | | | |
| | | | Yes | 4 | 2.9 | 0 | 0.0 | --- | 0.123 ^b | | |
| | | | No | 171 | 97.1 | 174 | 100.0 | | | | |
| | Enlisted Groundcrew | Enlisted Groundcrew | n | 457 | | 430 | | | | | |
| | | | Yes | 3 | 0.7 | 4 | 0.9 | 0.71 (0.16, 3.28) | 0.666 | | |
| | | | No | 454 | 99.3 | 426 | 99.1 | | | | |
| | | | | | | | | | | | |

^aAdjusted relative risk not calculated because of a zero cell count.

^bFisher's exact test.

TABLE H-15.

Unadjusted Analyses of Followup Participants with Lifetime Occurrence
of Verified and Suspected Lifetime Neoplasms by Group
(Nonblacks and Blacks, Original Comparisons Only)

| Site | Neoplasm Behavior and Status | Group | | | | Total** | p-Value*** |
|------------------------|--|------------|---------|------------|---------|---------|------------|
| | | Ranch Hand | | Comparison | | | |
| | | Number** | Percent | Number** | Percent | | |
| Skin | Malignant | | | | | | |
| | Verified | 66 | 6.5 | 48 | 5.0 | 114 | 0.177 |
| | Verified and Suspected | 75 | 7.4 | 62 | 6.5 | 137 | 0.479 |
| | Benign | | | | | | |
| | Verified | 84 | 8.3 | 67 | 7.0 | 151 | 0.310 |
| | Verified and Suspected | 86 | 8.5 | 70 | 7.3 | 156 | 0.360 |
| | Uncertain Behavior and Unspecified Nature: | | | | | | |
| | Verified | 1 | 0.1 | 1 | 0.1 | 2 | 0.999 |
| | Verified and Suspected | 1 | 0.1 | 1 | 0.1 | 2 | 0.999 |
| | Any Skin Neoplasm ^a | | | | | | |
| Verified | 150 | 14.8 | 111 | 11.6 | 261 | 0.046 | |
| Verified and Suspected | 159 | 15.7 | 128 | 13.4 | 287 | 0.160 | |
| Systemic | Malignant | | | | | | |
| | Verified | 17 | 1.7 | 14 | 1.5 | 31 | 0.722 |
| | Verified and Suspected | 21 | 2.1 | 19 | 2.0 | 40 | 0.999 |
| | Benign | | | | | | |
| | Verified | 51 | 5.0 | 52 | 5.5 | 103 | 0.687 |
| | Verified and Suspected | 57 | 5.6 | 60 | 6.3 | 117 | 0.568 |
| | Uncertain Behavior and Unspecified Nature: | | | | | | |
| | Verified | 15 | 1.5 | 11 | 1.2 | 26 | 0.560 |
| | Verified and Suspected | 15 | 1.5 | 14 | 1.5 | 29 | 0.999 |
| | Any Systemic Neoplasm ^b | | | | | | |
| Verified | 81 | 8.0 | 71 | 7.4 | 152 | 0.673 | |
| Verified and Suspected | 91 | 9.0 | 86 | 9.0 | 177 | 0.999 | |

TABLE H-15. (continued)

Unadjusted Analyses of Followup Participants with Lifetime Occurrence
of Verified and Suspected Lifetime Neoplasms by Group
(Nonblacks and Blacks, Original Comparisons Only)

| Site | Neoplasm Behavior and Status | Group | | | | | |
|------------------|---------------------------------|------------|---------|------------|---------|---------|------------|
| | | Ranch Hand | | Comparison | | Total** | p-Value*** |
| | | Number** | Percent | Number** | Percent | | |
| All Neoplasms | Malignant, Benign, | | | | | | |
| | Uncertain Behavior, | | | | | | |
| | Unspecified Nature ^c | | | | | | |
| | Verified | 216 | 21.3 | 167 | 17.5 | 383 | 0.035 |
| | Verified and Suspected | 231 | 22.7 | 196 | 20.5 | 427 | 0.251 |

*Sample sizes: 1,016 Ranch Hands, 955 Original Comparisons.

**Number of participants.

***Fisher's exact test.

^aParticipant has one or more malignant, benign, or unspecified skin neoplasms.

^bParticipant has one or more malignant, benign, or unspecified systemic neoplasms.

^cParticipant has one or more malignant or benign skin or systemic neoplasms.

TABLE H-16.

Unadjusted Analyses of Nonblack Followup Participants with Lifetime Occurrence
of Verified and Suspected Lifetime Malignant Skin Neoplasms by Cell Type and Group
(Original Comparisons Only)

| Cell Type | Status | Statistic | Group | | Est. Relative Risk (95% C.I.) | p-Value |
|--|----------------------|-----------------|------------|------------------------|----------------------------------|---------|
| | | | Ranch Hand | Original Comparison | | |
| Basal Cell Carcinoma | Verified | Number/% | 53 | 34 | 1.49 (0.96, 2.32) | 0.079 |
| | | Total Neoplasms | 77 | 52 | | |
| | Verified & Suspected | Number/% | 59 | 48 | 1.16 (0.79, 1.72) | 0.486 |
| | | Total Neoplasms | 88 | 68 | | |
| Squamous Cell Carcinoma | Verified | Number/% | 4 | 5 | 0.75 (0.20, 2.80) | 0.747 |
| | | Total Neoplasms | 6 | 6 | | |
| | Verified & Suspected | Number/% | 4 | 5 | 0.75 (0.20, 2.80) | 0.747 |
| | | Total Neoplasms | 6 | 6 | | |
| Melanoma | Verified | Number/% | 5 | 5 | 0.94 (0.27, 3.25) | 0.999 |
| | | Total Neoplasms | 6 | 6 | | |
| | Verified & Suspected | Number/% | 5 | 6 | 0.78 (0.24, 2.57) | 0.768 |
| | | Total Neoplasms | 6 | 7 | | |
| All Malignant Skin Neoplasms | Verified | Number/% | 66 | 48 | 1.31 (0.89, 1.93) | 0.176 |
| | | Total Neoplasms | 103 | 73 | | |
| | Verified & Suspected | Number/% | 75 | 62 | 1.15 (0.81, 1.63) | 0.478 |
| | | Total Neoplasms | 117 | 90 | | |
| Sun-Exposure Related Malignant Neoplasms* | Verified | Number/% | 59 | 39 | 1.45 (0.96, 2.19) | 0.096 |
| | | Total Neoplasms | 90 | 58 | | |
| | Verified & Suspected | Number/% | 65 | 53 | 1.16 (0.80, 1.69) | 0.448 |
| | | Total Neoplasms | 101 | 75 | | |

*Number and percent of participants; total number of malignant neoplasms of specified cell type.

**Number of participants -- 956 Ranch Hands and 897 Original Comparisons.

*Basal cell carcinoma, melanoma, and malignant epithelial neoplasms NOS.

TABLE B-17.

Association Between Lifetime Incidence of Sun-Exposure Related Skin Malignancies
and the Covariates for Combined Followup Ranch Hand and Comparison Nonblack Participants

| Covariate | Covariate Category | Verified | | Verified and Suspected | |
|---|-----------------------|----------|---------|------------------------|---------|
| | | Number* | Percent | Number* | p-Value |
| Age | Born ≥ 1942 | 8 | 9.2 | 28 | 3.2 |
| | Born 1923-41 | 83 | 6.9 | 99 | 8.3 |
| | Born ≤ 1922 | 23 | 2.6 | 12 | 13.8 |
| Occupation | Officer | 60 | 7.1 | 75 | 8.8 |
| | Enlisted Flyer | 17 | 4.7 | 20 | 5.6 |
| | Enlisted Groundcrew | 37 | 3.9 | 44 | 4.6 |
| Total Lifetime Smoking (Pack-Years) | 0 | 35 | 5.7 | 40 | 6.5 |
| | >0-20 | 40 | 4.0 | 49 | 4.9 |
| | >20-40 | 24 | 6.1 | 34 | 8.7 |
| | >40 | 15 | 9.6 | 16 | 10.2 |
| Total Lifetime Alcohol Consumption (Drink-Years) | 0 | 8 | 5.7 | 9 | 6.4 |
| | >0-5 | 39 | 5.4 | 45 | 6.3 |
| | >5-30 | 29 | 4.4 | 36 | 5.5 |
| | >30-100 | 24 | 5.0 | 35 | 7.3 |
| | >100 | 11 | 10.6 | 11 | 10.6 |
| Ethnic Background ^a | A | 95 | 6.0 | 118 | 7.5 |
| | B | 16 | 3.8 | 17 | 4.0 |
| | C | 1 | 1.6 | 1 | 1.6 |
| | D | 0 | 0.0 | 0 | 0.0 |
| Skin Color | Dark | 0 | 0.0 | 0 | 0.0 |
| | Medium | 2 | 2.7 | 2 | 2.7 |
| | Pale | 10 | 3.3 | 12 | 3.9 |
| | Dark Peach | 76 | 6.0 | 90 | 7.1 |
| | Pale Peach | 26 | 5.0 | 35 | 6.7 |

TABLE H-17. (continued)
Association Between Lifetime Incidence of Sun-Exposure Related Skin Malignancies
and the Covariates for Combined Followup Ranch Hand and Comparison Nonblack Participants

| Covariate | Covariate Category | Verified | | Verified and Suspected | |
|--|-----------------------|----------|---------|------------------------|---------|
| | | Number* | Percent | p-Value | p-Value |
| Eye Color | Brown | 34 | 5.3 | 0.466 | 0.960 |
| | Hazel | 31 | 6.8 | | |
| | Green | 4 | 3.4 | | |
| | Grey | 5 | 5.4 | | |
| | Blue | 40 | 4.7 | | |
| Hair Color | Black | 22 | 5.0 | 0.230 | 0.096 |
| | Dark Brown | 46 | 4.4 | | |
| | Light Brown | 36 | 6.4 | | |
| | Red | 2 | 12.5 | | |
| | Blond | 8 | 7.4 | | |
| Residential History (Average Latitude) | ≥37° | 48 | 4.2 | 0.026 | 0.003 |
| | <37° | 66 | 6.5 | | |
| Skin Reaction to First 30 Min. of Sun Exposure | Burns | 23 | 9.3 | <0.001 | <0.001 |
| | Usually Burns | 39 | 9.1 | | |
| | Burns Mildly | 34 | 4.2 | | |
| | Rarely Burns | 17 | 2.5 | | |
| Skin Reaction to >2 Hrs of Sun After First Exposure | Burns Painfully | 13 | 10.8 | <0.001 | <0.001 |
| | Burns | 32 | 9.5 | | |
| | Becomes Red | 46 | 4.4 | | |
| | No Reaction | 23 | 3.5 | | |
| Skin Reaction After Repeated Exposure to Sun | Freckles, No Tan | 5 | 11.1 | <0.001 | <0.001 |
| | Tans Mildly | 33 | 10.5 | | |
| | Tans Moderately | 40 | 3.9 | | |
| | Tans Deep Brown | 35 | 4.5 | | |

TABLE H-17. (continued)
 Association Between Lifetime Incidence of Sun-Exposure Related Skin Malignancies
 and the Covariates for Combined Followup Ranch Hand and Comparison Nonblack Participants

| Covariate | Covariate Category | Verified | | | Verified and Suspected | | |
|-------------------------------|----------------------|----------|---------|---------|------------------------|---------|---------|
| | | Number* | Percent | p-Value | Number* | Percent | p-Value |
| Sun Reaction Index | Tends to Burn | 14 | 9.7 | <0.001 | 16 | 11.0 | <0.001 |
| | Mild Reaction | 42 | 9.3 | | 48 | 10.6 | |
| | Tends to Tan | 57 | 3.7 | | 74 | 4.7 | |
| Exposures to Carcinogens | Asbestos | Yes 19 | 4.2 | 0.288 | 26 | 5.7 | 0.520 |
| | | No 95 | 5.6 | | 113 | 6.6 | |
| | Nonmedical X Rays | Yes 31 | 6.3 | 0.252 | 39 | 7.9 | 0.143 |
| | | No 83 | 5.0 | | 100 | 6.0 | |
| | Industrial Chemicals | Yes 54 | 4.8 | 0.336 | 65 | 5.8 | 0.220 |
| | | No 60 | 5.8 | | 74 | 7.1 | |
| | Herbicides | Yes 74 | 5.9 | 0.144 | 91 | 7.2 | 0.076 |
| | | No 40 | 4.4 | | 48 | 5.3 | |
| | Insecticides | Yes 76 | 5.8 | 0.200 | 40 | 6.9 | 0.324 |
| | | No 38 | 4.5 | | 49 | 5.7 | |
| | Degreasing Chemicals | Yes 64 | 5.1 | 0.697 | 77 | 6.1 | 0.534 |
| | | No 50 | 5.5 | | 62 | 6.9 | |
| Composite Carcinogen Exposure | | Yes 21 | 4.3 | 0.355 | 24 | 4.9 | 0.141 |
| | | No 91 | 5.5 | | 113 | 6.8 | |

TABLE B-17. (continued)

| Covariate | Covariate Category | Verified | | | Verified and Suspected | | |
|------------------------------------|--------------------|-----------------|------------|---------|------------------------|-------------|---------|
| | | Number* | Percent | p-Value | Number* | Percent | p-Value |
| Exposure to Individual Carcinogens | Anthracene | Yes 0 No 114 | 0.0 5.3 | 0.999 | 0 139 | 0.0 6.4 | 0.999 |
| | Arsenic | Yes 4 No 109 | 9.8 5.1 | 0.163 | 5 133 | 12.2 6.3 | 0.181 |
| | Benzene | Yes 6 No 108 | 8.1 5.2 | 0.281 | 7 132 | 9.5 6.3 | 0.327 |
| | Benizidine | Yes 1 No 113 | 9.1 5.3 | 0.449 | 1 138 | 9.1 6.4 | 0.519 |
| | Chromates | Yes 4 No 108 | 4.8 5.2 | 0.999 | 5 132 | 6.0 6.4 | 0.999 |
| | Coal Tar | Yes 2 No 112 | 2.9 5.3 | 0.580 | 3 136 | 4.4 6.5 | 0.799 |
| | Creosote | Yes 9 No 105 | 5.7 5.2 | 0.715 | 10 129 | 6.3 6.4 | 0.999 |
| | Aminodiphenyl | Yes 0 No 113 | 0.0 5.2 | 0.999 | 0 138 | 0.0 6.4 | 0.999 |
| | Chloromethyl Ether | Yes 2 No 112 | 9.5 5.2 | 0.305 | 2 137 | 9.5 6.4 | 0.641 |
| | Mustard Gas | Yes 0 No 114 | 0.0 5.3 | 0.999 | 0 139 | 0.0 6.4 | 0.999 |

TABLE H-17. (continued)

Association Between Lifetime Incidence of Sun-Exposure Related Skin Malignancies
and the Covariates for Combined Followup Ranch Hand and Comparison Nonblack Participants

| Covariate | Covariate Category | Verified | | Verified and Suspected | |
|---|-----------------------|------------------|-------------|------------------------|----------------------|
| | | Number* | Percent | Number* | p-Value |
| Exposure to Individual Carcinogens (continued) | Naphthylamine | Yes 3 No 110 | 5.8 5.2 | 4 134 | 0.751 7.7 6.3 |
| | Cutting Oils | Yes 12 No 102 | 5.3 5.3 | 15 124 | 0.999 6.6 6.4 |
| | Trichloroethylene | Yes 5 No 109 | 2.7 5.5 | 7 132 | 0.120 3.8 6.7 |
| | Ultraviolet Light | Yes 5 No 109 | 11.4 5.1 | 5 134 | 0.078 11.4 6.3 |
| | Vinyl Chloride | Yes 0 No 114 | 0.0 5.3 | 1 138 | 0.406 3.2 6.5 |

*Number of participants with sun-exposure related skin malignancies.

Ethnic Background:

A—English, Welsh, Scottish, Irish.

B—Scandinavian, German, Polish, Russian, other Slavic, Jewish, French.

C—Spanish, Italian, Greek.

D—Mexican, American Indian, Asian.

TABLE H-18.

Summary of Group-by-Covariate Interactions for
Lifetime Malignant Skin Neoplasm Incidence
(Nonblacks Only)

| Variable | Interaction | Stratification | Statistic | Group | | | | Adj. Relative Risk (95% C.I.) | p-Value |
|--|-----------------------|----------------|-----------|------------|---------|---------------------|-------------------|-------------------------------|---------|
| | | | | Ranch Hand | | Original Comparison | | | |
| | | | | Number | Percent | Number | Percent | | |
| | Burns Easily | n | 68 | | 77 | | | | |
| | | Yes | 3 | 4.4 | 9 | 11.7 | 0.29 (0.07, 1.28) | 0.102 | |
| | | No | 65 | 95.6 | 68 | 88.3 | | | |
| Basal Cell Carcinoma (Verified Index Plus Suspected) | Group-by-Sun Reaction | n | 192 | | 262 | | | | |
| | | Yes | 25 | 13.0 | 21 | 8.0 | 1.97 (1.04, 3.73) | 0.038 | |
| | | No | 167 | 87.0 | 241 | 92.0 | | | |
| | Tans Easily | n | 693 | | 867 | | | | |
| | | Yes | 31 | 4.5 | 36 | 4.2 | 1.15 (0.70, 1.88) | 0.591 | |
| | | No | 662 | 95.5 | 831 | 95.8 | | | |

TABLE H-19.

Adjusted Analyses of Nonblack Followup Participants
for Lifetime Malignant Skin Neoplasm Incidence
(Original Comparisons Only)

| Variable | Status | Adj. Relative Risk (95% C.I.) | p-Value | Covariate Remarks |
|--------------------------------|-------------------------|----------------------------------|---------|--|
| Basal Cell Carcinoma | Verified | **** | **** | GRP*SUNREAC (p=0.010) SKIN*SUNREAC (p<0.001) OCC*AGE (p=0.010) OCC*SUNREAC (p=0.007) LAT (p=0.006) |
| | Verified & Suspected | **** | **** | GRP*SUNREAC (p=0.003) AGE (p<0.001) LAT (p=0.002) SUNREAC*OCC (p=0.043) SKIN*SUNREAC (p<0.001) |
| Sun-Exposure Skin Neoplasms | Verified | **** | **** | GRP*SUNREAC (p=0.045) SKIN*LAT (p=0.028) SKIN*SUNREAC (p<0.001) OCC*AGE (p=0.023) |
| | Verified & Suspected | **** | **** | GRP*SUNREAC (p=0.016) AGE (p<0.001) SUNREAC*LAT (p=0.017) SKIN*SUNREAC (p<0.001) |

****Group-by-covariate interactions--adjusted relative risk, confidence interval, and p-value not presented.

TABLE H-20.

Summary of Group-by-Covariate Interactions
for Lifetime Malignant Skin Neoplasms Incidence
(Original Comparisons Only*)

| Variable | Interaction | Stratification | Statistic | Group | | | Adj. Relative Risk (95% C.I.) | p-Value |
|---|-----------------------|----------------|-----------|------------|------------------------|----------------|----------------------------------|---------|
| | | | | Ranch Hand | Original Comparison | Number Percent | | |
| Basal Cell Carcinoma (Verified Only) | Burns Easily | n | Yes | 68 | 56 | | | |
| | | | No | 3 | 6 | 10.7 | 0.17 (0.02, 1.67) | 0.128 |
| | Intermediate | n | Yes | 65 | 50 | 89.3 | | |
| | | | No | 192 | 186 | | | |
| | Sun Reaction Index | n | Yes | 23 | 8 | 4.3 | 3.76 (1.60, 8.86) | 0.002 |
| | | | No | 169 | 178 | 95.7 | | |
| | Tans Easily | n | Yes | 693 | 652 | | | |
| | | | No | 27 | 19 | 2.9 | 1.45 (0.79, 2.67) | 0.226 |
| | | | | 666 | 633 | 96.1 | | |

TABLE H-20. (continued)

Summary of Group-by-Covariate Interactions for
Lifetime Malignant Skin Neoplasms Incidence
(Original Comparisons Only*)

| Variable | Interaction | Stratification | Statistic | Group | | | | Adj. Relative Risk (95% C.I.) | p-Value |
|--|--------------|----------------|-----------|------------|---------|------------------------|---------|----------------------------------|---------|
| | | | | Ranch Hand | | Original Comparison | | | |
| | | | | Number | Percent | Number | Percent | | |
| Basal Cell Carcinoma (Verified Plus Suspected) | Burns Easily | n | 68 | | 56 | | | | |
| | | Yes | 3 | 4.4 | 8 | 14.3 | 0.19 | 0.070 | |
| | | No | 65 | 95.6 | 48 | 85.7 | | | |
| | Intermediate | n | 192 | | 186 | | | | |
| | | Yes | 25 | 13.0 | 10 | 5.4 | 3.25 | 0.003 | |
| | | No | 167 | 87.0 | 176 | 94.6 | | | |
| Tans Easily | n | 693 | | 652 | | | | | |
| | Yes | 31 | 4.5 | 29 | 4.4 | 1.10 | 0.719 | | |
| | No | 662 | 95.5 | 623 | 95.6 | | | | |

TABLE H-20. (continued)

Summary of Group-by-Covariate Interactions for
Lifetime Malignant Skin Neoplasms Incidence
(Original Comparisons Only*)

| Variable | Interaction | Stratification | Statistic | Group | | | | Adj. Relative Risk (95% C.I.) | p-Value |
|--|--------------|----------------|-----------|------------|---------|---------------------|-------------------|-------------------------------|---------|
| | | | | Ranch Hand | | Original Comparison | | | |
| | | | | Number | Percent | Number | Percent | | |
| Sun Exposure Related Cancers (Verified Plus Suspected) | Burns Easily | n | 68 | | 56 | | | | |
| | | Yes | 7 | 10.3 | 8 | 14.3 | 1.20 (0.34, 4.22) | 0.777 | |
| | | No | 61 | 89.7 | 48 | 85.7 | | | |
| | Intermediate | n | 192 | | 186 | | | | |
| | | Yes | 26 | 13.5 | 10 | 5.4 | 3.98 (1.70, 9.33) | 0.002 | |
| | | No | 166 | 86.5 | 176 | 94.6 | | | |
| | Tans Easily | n | 693 | | 652 | | | | |
| | | Yes | 32 | 4.6 | 34 | 5.2 | 1.17 (0.31, 4.41) | 0.819 | |
| | | No | 661 | 95.4 | 618 | 94.8 | | | |
| | | | | | | | | | |

TABLE H 20. (continued)

Summary of Group-by Covariate Interactions for
Lifetime Malignant Skin Neoplasia Incidence
(Original Comparisons Only*)

| Variable | Interaction | Stratification | Statistic | Group | | | | Adj. Relative Risk (95% C.I.) | p-Value |
|--|-----------------------------|----------------|-----------|------------|---------|---------------------|------------------|-------------------------------|---------|
| | | | | Ranch Hand | | Original Comparison | | | |
| | | | | Number | Percent | Number | Percent | | |
| Sun Exposure Related Cancers (Verified Only) | Group-by-Sun Reaction Index | Burns Easily | n | 68 | | 56 | | | |
| | | | Yes | 7 | 10.3 | 6 | 10.7 | 0.80 (0.25,2.53) | 0.700 |
| | | | No | 61 | 89.7 | 50 | 89.3 | | |
| | | Intermediate | n | 192 | | 186 | | | |
| | | | Yes | 24 | 12.5 | 8 | 4.3 | 3.42 (1.56,7.51) | 0.002 |
| | | | No | 168 | 87.5 | 178 | 95.7 | | |
| | Tans Easily | n | 693 | | 652 | | | | |
| | | Yes | 28 | 4.0 | 24 | 3.7 | 0.97 (0.59,1.61) | 0.911 | |
| | | No | 665 | 96.0 | 628 | 96.3 | | | |

*Blacks excluded.

TABLE B-21.

Summary of Followup Participants With Lifetime Incidence of
Verified Malignant Systemic Neoplasms by Group
(Original Comparisons Only)

| Site | Group | | Total |
|-------------------------------------|-----------------------|-----------------------|----------|
| | Ranch Hand | Original Comparison | |
| Eye | 1 | 0 | 1 |
| Oral Cavity and Pharynx | 3 ^{a, b} | 0 | 3 |
| Larynx | 0 | 1 | 1 |
| Thyroid Gland | 0 | 2 | 2 |
| Bronchus and Lung | 2 | 0 | 2 |
| Colon | 0 | 4 ^{c, d} | 4 |
| Kidney and Bladder | 4 | 3 | 7 |
| Prostate | 2 | 2 | 4 |
| Testicles | 3 | 0 | 3 |
| Connective and Other Soft Tissue | 1 | 1 | 2 |
| Ill-Defined Sites | <u>1</u> ^e | <u>1</u> ^f | <u>2</u> |
| Total | 17 | 14 | 31 |

^aIncludes one Ranch Hand with separate malignancies of tongue and epiglottis and also malignant neoplasm of bone.

^bIncludes one Ranch Hand with separate malignant neoplasms of tongue and oropharynx and secondary malignant neoplasm of other site.

^cIncludes one Comparison with secondary malignant neoplasms of liver and bone and bone marrow.

^dIncludes one Comparison with secondary malignant neoplasm of liver.

^eMalignant neoplasm of thorax.

^fMalignant neoplasm of face, head, or neck.

TABLE H-22.

Unadjusted Analyses of the Lifetime Incidence Rates
of All Malignant Systemic Neoplasms Combined, by Group
(Original Comparisons Only)

| Status | Statistic | Group | | Est. Relative Risk (95% C.I.) | p-Value |
|----------------------|-----------------|------------|------------------------|----------------------------------|---------|
| | | Ranch Hand | Original Comparison | | |
| Verified | Number/% | 17 1.7% | 14 1.5% | 1.14 (0.56,2.33) | 0.722 |
| | Total Neoplasms | 25 | 19 | | |
| Verified & Suspected | Number/% | 21 2.1% | 19 2.0% | 1.04 (0.56,1.95) | 0.999 |
| | Total Neoplasms | 36 | 24 | | |

TABLE H-23.

Summary of Group-by-Occupation Interactions
for Lifetime Incidence of All Malignant
Systemic Neoplasms Combined

| Variable | Interaction | Stratification | Statistic | Group | | | | Adj. Relative Risk (95% C.I.) | p-Value |
|---|-------------|---------------------|-----------|------------|---------|------------|---------|-------------------------------|--------------------|
| | | | | Ranch Hand | | Comparison | | | |
| | | | | Number | Percent | Number | Percent | | |
| Malignant Systemic Neoplasm (Verified Only) | Officer | n | | 380 | | 484 | | | |
| | | Yes | | 8 | 2.1 | 12 | 2.5 | 0.84 (0.34, 2.08) | 0.698 |
| | | No | | 372 | 97.9 | 472 | 97.5 | | |
| | | Enlisted Flyer | n | | 177 | | 210 | | |
| | Yes | | | 5 | 2.8 | 0 | 0 | | 0.019 ^b |
| | | No | | 172 | 97.2 | 210 | 100 | | |
| | | Enlisted Groundcrew | n | | 459 | | 599 | | |
| | Yes | | | 4 | 0.9 | 5 | 0.8 | 1.07 (0.28, 4.03) | 0.922 |
| | | No | | 455 | 99.1 | 594 | 99.2 | | |

^aAdjusted relative risk not calculated because of a zero cell.

^bFisher's exact test.

TABLE H-23. (continued)

Summary of Group-by-Occupation Interactions
for Lifetime Incidence of All Malignant
Systemic Neoplasms Combined

| Variable | Interaction | Stratification | Statistic | Group | | | | Adj. Relative Risk (95% C.I.) | p-Value |
|---|----------------|----------------|-----------|------------|---------|-------------------|-------------------|-------------------------------|---------|
| | | | | Ranch Hand | | Comparison | | | |
| | | | | Number | Percent | Number | Percent | | |
| Malignant Systemic Neoplasm (Verified plus Suspected) | Officer | n | 380 | | 484 | | | | |
| | | Yes | 9 | 2.4 | 14 | 2.9 | 0.80 (0.34, 1.89) | 0.616 | |
| | | No | 371 | 97.6 | 470 | 97.1 | | | |
| | Enlisted Flyer | n | 175 | | 209 | | | | |
| | | Yes | 7 | 4.0 | 0 | 0 | --- | 0.004 ^b | |
| | | No | 168 | 96.0 | 209 | 100 | | | |
| Enlisted Groundcrew | n | 457 | | 598 | | | | | |
| | Yes | 5 | 1.1 | 8 | 1.3 | 0.79 (0.26, 2.47) | 0.690 | | |
| | No | 452 | 98.9 | 590 | 98.7 | | | | |

^aAdjusted relative risk not calculated because of a zero cell.

^bFisher's exact test.

TABLE H-24.

Adjusted Analyses for Lifetime Incidence of All
Malignant Systemic Neoplasms Combined
(Original Comparisons Only)

| Variable | Adj. Relative Risk (95% C.I.) | p-Value | Covariate Remarks |
|---|----------------------------------|---------|---|
| Malignant Systemic Neoplasms (Verified) | **** | **** | GRP*OCC (p=0.034) AGE (p<0.001) |
| Malignant Systemic Neoplasms (Verified & Suspected) | **** | **** | GRP*OCC (p=0.003) AGE (p<0.001) RACE*PACKYR (p=0.033) |

****Group-by-covariate interaction--adjusted relative risk, confidence interval, and p-value not presented.

TABLE H-25.

Summary of Group-by-Occupation Interactions
for Lifetime Incidence of All Malignant
Systemic Neoplasms Combined
(Original Comparisons Only)

| Variable | Interaction | Stratification | Statistic | Group | | Statistic | Original Comparison | | Adj. Relative Risk (95% C.I.) | p-Value |
|--|---------------------|----------------|-----------|-------|------|-----------|---------------------|---------|-------------------------------|--------------------|
| | | | | Ranch | Hand | | Number | Percent | | |
| Malignant Systemic Neoplasms (Verified Only) | Officer | n | | 380 | | | 350 | | | |
| | | Yes | | 8 | 2.1 | | 9 | | | |
| | Enlisted Flyer | No | | 372 | 97.9 | | 341 | 2.6 | 0.90 (0.34, 2.38) | 0.834 |
| | | n | | 177 | | | 174 | | | |
| | Group-by-Occupation | Yes | | 5 | 2.8 | | 0 | 0 | -- ^a | 0.061 ^b |
| | | No | | 172 | 97.2 | | 174 | 100 | | |
| Enlisted Groundcrew | Enlisted Groundcrew | n | | 459 | | | 431 | | | |
| | | Yes | | 4 | 0.9 | | 5 | 1.2 | 0.81 (0.21, 3.07) | 0.757 |
| | | No | | 455 | 99.1 | | 426 | 98.8 | | |

TABLE H-25. (continued)

Summary of Group-by-Occupation Interactions
for Lifetime Incidence of All Malignant
Systemic Neoplasms Combined
(Original Comparisons Only)

| Variable | Interaction | Stratification | Statistic | Group | | | | Adj. Relative Risk (95% C.I.) | p-Value |
|--|---------------------|----------------|-----------|------------|---------|---------------------|-------------------|-------------------------------|---------|
| | | | | Ranch Hand | | Original Comparison | | | |
| | | | | Number | Percent | Number | Percent | | |
| Malignant Systemic Neoplasms (Verified Plus Suspected) | Officer | n | 380 | | 350 | | | | |
| | | Yes | 9 | 2.4 | 11 | 3.1 | 0.81 (0.33, 1.98) | 0.638 | |
| | Enlisted Flyer | No | 371 | 97.6 | 339 | 96.9 | | | |
| | | n | 175 | | 174 | | | | |
| | Group-by-Occupation | Yes | 7 | 4.0 | 0 | 0 | -- ^a | 0.015 ^a | |
| | | No | 168 | 96.0 | 174 | 100 | | | |
| Enlisted Groundcrew | Enlisted Groundcrew | n | 457 | | 430 | | | | |
| | | Yes | 5 | 1.1 | 8 | 1.9 | 0.59 (0.19, 1.85) | 0.369 | |
| | | No | 452 | 98.9 | 422 | 98.1 | | | |

^aAdjusted relative risk not calculated because of zero cell.

^bFisher's exact test.

TABLE B-26.

Unadjusted Exposure Index Analyses for Followup Participants
for Occurrence of Malignant Neoplasms
in the Baseline-Followup Interval

| Variable | Occupation | Statistic | Exposure Index ^a | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|--|---------------------|-----------|-----------------------------|---------|--------|---------|--------|---------|----------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Basal Cell Carcinoma (Verified Only) ^b | Officer | n | 125 | | 127 | | 121 | | Overall | | 0.178 |
| | | Abnormal | 3 | 2.4 | 8 | 6.3 | 3 | 2.5 | M vs. L | 2.73 (0.71, 10.55) | 0.216 |
| | | Normal | 122 | 97.6 | 119 | 93.7 | 118 | 97.5 | H vs. L | 1.03 (0.21, 5.23) | 0.999 |
| | Enlisted Flyer | n | 54 | | 61 | | 52 | | Overall | | 0.073 |
| | | Abnormal | 6 | 11.1 | 2 | 3.3 | 1 | 1.9 | M vs. L | 0.27 (0.05, 1.41) | 0.145 |
| | | Normal | 48 | 88.9 | 59 | 96.7 | 51 | 98.1 | H vs. L | 0.16 (0.02, 1.35) | 0.113 |
| | Enlisted Groundcrew | n | 138 | | 149 | | 129 | | Overall | | 0.627 |
| | | Abnormal | 3 | 2.2 | 2 | 1.3 | 1 | 0.8 | M vs. L | 0.61 (0.10, 3.72) | 0.674 |
| | | Normal | 135 | 97.8 | 147 | 98.7 | 128 | 99.2 | H vs. L | 0.35 (0.04, 3.42) | 0.623 |
| Basal Cell Carcinoma (Verified and Suspected) ^b | Officer | n | 125 | | 127 | | 121 | | Overall | | 0.042 |
| | | Abnormal | 4 | 3.3 | 12 | 9.4 | 4 | 3.3 | M vs. L | 3.16 (0.99, 10.07) | 0.068 |
| | | Normal | 121 | 96.8 | 115 | 90.6 | 121 | 96.7 | H vs. L | 1.03 (0.25, 4.23) | 0.999 |
| | Enlisted Flyer | n | 54 | | 61 | | 52 | | Overall | | 0.073 |
| | | Abnormal | 6 | 11.1 | 2 | 3.3 | 1 | 1.9 | M vs. L | 0.27 (0.05, 1.41) | 0.145 |
| | | Normal | 48 | 88.9 | 59 | 96.7 | 51 | 98.1 | H vs. L | 0.16 (0.02, 1.35) | 0.113 |
| | Enlisted Groundcrew | n | 138 | | 149 | | 129 | | Overall | | 0.372 |
| | | Abnormal | 4 | 2.9 | 2 | 1.3 | 1 | 0.8 | M vs. L | 0.46 (0.08, 2.53) | 0.432 |
| | | Normal | 134 | 97.1 | 147 | 98.7 | 128 | 99.2 | H vs. L | 0.26 (0.03, 2.37) | 0.372 |

TABLE H-26. (continued)

Unadjusted Exposure Index Analyses for Followup Participants
for Occurrence of Malignant Neoplasms
in the Baseline-Followup Interval

| Variable | Occupation | Statistic | Exposure Index ^a | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|---|---|-----------|-----------------------------|---------|--------|---------|--------|---------|----------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Sun-Exposure Related Malignancies (Verified Only) ^b | Officer | n | 125 | | 127 | | 121 | | Overall | | 0.096 |
| | | Abnormal | 3 | 2.4 | 9 | 7.1 | 3 | 2.5 | M vs. L | 3.10 (0.82,11.74) | 0.136 |
| | | Normal | 122 | 97.6 | 118 | 92.9 | 118 | 97.5 | H vs. L | 1.03 (0.21,5.23) | 0.999 |
| | Enlisted Flyer | n | 54 | | 61 | | 52 | | Overall | | 0.073 |
| | | Abnormal | 6 | 11.1 | 2 | 3.3 | 1 | 1.9 | M vs. L | 0.27 (0.05,1.41) | 0.145 |
| | | Normal | 48 | 88.9 | 59 | 96.7 | 51 | 98.1 | H vs. L | 0.16 (0.02,1.35) | 0.113 |
| | Enlisted Groundcrew | n | 138 | | 149 | | 129 | | Overall | | 0.929 |
| | | Abnormal | 3 | 2.2 | 3 | 2.0 | 2 | 1.6 | M vs. L | 0.93 (0.18,4.66) | 0.999 |
| | | Normal | 135 | 97.8 | 146 | 98.0 | 127 | 98.4 | H vs. L | 0.71 (0.12,4.31) | 0.999 |
| | Sun-Exposure Related Malignancies (Verified and Suspected) ^b | Officer | n | 125 | | 127 | | 121 | | Overall | |
| Abnormal | | | 4 | 3.2 | 13 | 10.2 | 4 | 3.3 | M vs. L | 3.45 (1.09,10.89) | 0.042 |
| Normal | | | 121 | 96.8 | 114 | 89.8 | 117 | 96.7 | H vs. L | 1.03 (0.25,4.23) | 0.999 |
| Enlisted Flyer | | n | 54 | | 61 | | 52 | | Overall | | 0.073 |
| | | Abnormal | 6 | 11.1 | 2 | 3.3 | 1 | 1.9 | M vs. L | 0.27 (0.05,1.41) | 0.145 |
| | | Normal | 48 | 88.9 | 59 | 96.7 | 51 | 98.1 | H vs. L | 0.16 (0.02,1.35) | 0.113 |
| Enlisted Groundcrew | | n | 138 | | 149 | | 129 | | Overall | | 0.742 |
| | | Abnormal | 4 | 2.9 | 3 | 2.0 | 2 | 1.6 | M vs. L | 0.69 (0.15,3.13) | 0.714 |
| | | Normal | 134 | 97.1 | 146 | 98.0 | 127 | 98.4 | M vs. L | 0.53 (0.10,2.93) | 0.685 |

TABLE H-26. (continued)

Unadjusted Exposure Index Analyses for Followup Participants
for Occurrence of Malignant Neoplasms
in the Baseline-Followup Interval

| Variable | Occupation | Statistic | Exposure Index ^a | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|---|---------------------|-----------|-----------------------------|---------|--------|---------|--------|---------|---------------------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Systemic Malignancies (Verified Only) ^c | Officer | n | 127 | | 130 | | 123 | | Overall | | 0.186 |
| | | Abnormal | 1 | 0.8 | 3 | 2.3 | 0 | 0.0 | M vs. L | 2.98 (0.31, 29.00) | 0.622 |
| | | Normal | 126 | 99.2 | 127 | 97.7 | 123 | 100.0 | H vs. L | 0.34 (0.01, 8.46)* | 0.999 |
| | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.612 |
| | | Abnormal | 1 | 1.8 | 1 | 1.5 | 0 | 0.0 | M vs. L | 0.84 (0.05, 13.81) | 0.999 |
| | | Normal | 54 | 98.2 | 64 | 98.5 | 57 | 100.0 | H vs. L | 0.32 (0.01, 7.92)* | 0.491 |
| Enlisted Groundcrew | n | 154 | | 163 | | 142 | | Overall | | 0.598 | |
| | Abnormal | 0 | 0.0 | 1 | 0.6 | 1 | 0.7 | M vs. L | 2.85 (0.12, 70.55)* | 0.999 | |
| | Normal | 154 | 100.0 | 162 | 99.4 | 141 | 99.3 | H vs. L | 3.28 (0.13, 81.06)* | 0.480 | |
| Systemic Malignancies (Verified and Suspected) ^c | Officer | n | 127 | | 130 | | 123 | | Overall | | 0.081 |
| | | Abnormal | 1 | 0.8 | 4 | 3.1 | 0 | 0.0 | M vs. L | 4.00 (0.44, 36.29) | 0.370 |
| | | Normal | 126 | 99.2 | 126 | 96.9 | 123 | 100.0 | H vs. L | 0.34 (0.01, 8.46)* | 0.999 |
| | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.708 |
| | | Abnormal | 2 | 3.6 | 1 | 1.5 | 1 | 1.8 | M vs. L | 0.41 (0.04, 4.69) | 0.593 |
| | | Normal | 53 | 96.4 | 64 | 98.5 | 56 | 98.2 | H vs. L | 0.47 (0.04, 5.37) | 0.615 |
| | Enlisted Groundcrew | n | 154 | | 163 | | 142 | | Overall | | 0.323 |
| | | Abnormal | 0 | 0.0 | 1 | 0.6 | 2 | 1.4 | M vs. L | 2.85 (0.12, 70.55)* | 0.999 |
| | | Normal | 154 | 100.0 | 162 | 99.4 | 140 | 98.6 | H vs. L | 5.50 (0.26, 115.51)* | 0.229 |

^aNumber and percent of total participants.

^bNonblacks only.

^cBlacks and nonblacks.

*0.5 added to each cell to calculate relative risk and confidence interval, due to zero cell frequency.

TABLE H-27.
Unadjusted Exposure Index Analysis for Followup Participants
for Lifetime Occurrence of Malignant Neoplasms

| Variable | Occupation | Statistic | Exposure Index ^a | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|--|---------------------|-----------|-----------------------------|---------|--------|---------|--------|---------|----------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Basal Cell Carcinoma (Verified only) ^b | Officer | n | 125 | | 127 | | 121 | | Overall | | 0.641 |
| | | Abnormal | 7 | 5.6 | 11 | 8.7 | 9 | 7.4 | M vs. L | 1.60 (0.60,4.27) | 0.464 |
| | Enlisted Flyer | Normal | 118 | 94.4 | 116 | 91.3 | 112 | 92.6 | H vs. L | 1.36 (0.49,3.76) | 0.613 |
| | | n | 54 | | 61 | | 52 | | Overall | | 0.030 |
| | Enlisted Groundcrew | Abnormal | 7 | 13.0 | 2 | 3.3 | 1 | 1.9 | M vs. L | 0.23 (0.05,1.15) | 0.081 |
| | | Normal | 47 | 87.0 | 59 | 96.7 | 51 | 98.1 | H vs. L | 0.13 (0.02,1.11) | 0.060 |
| Basal Cell Carcinoma (Verified and Suspected) ^b | Officer | n | 138 | | 149 | | 129 | | Overall | | 0.984 |
| | | Abnormal | 5 | 3.6 | 6 | 4.0 | 5 | 3.9 | M vs. L | 1.12 (0.33,3.74) | 0.999 |
| | Enlisted Flyer | Normal | 133 | 96.4 | 143 | 96.0 | 124 | 96.1 | H vs. L | 1.07 (0.30,3.80) | 0.999 |
| | | n | 125 | | 127 | | 121 | | Overall | | 0.419 |
| | Enlisted Groundcrew | Abnormal | 8 | 6.4 | 14 | 11.0 | 10 | 8.3 | M vs. L | 1.81 (0.73,4.49) | 0.265 |
| | | Normal | 117 | 93.6 | 113 | 89.0 | 111 | 91.7 | H vs. L | 1.32 (0.50,3.46) | 0.630 |
| Basal Cell Carcinoma (Verified and Suspected) ^b | Officer | n | 54 | | 61 | | 52 | | Overall | | 0.030 |
| | | Abnormal | 7 | 13.0 | 2 | 3.3 | 1 | 1.9 | M vs. L | 0.23 (0.05,1.15) | 0.081 |
| | Enlisted Flyer | Normal | 47 | 87.0 | 59 | 96.7 | 51 | 98.1 | H vs. L | 0.13 (0.02,1.11) | 0.060 |
| | | n | 138 | | 149 | | 129 | | Overall | | 0.980 |
| | Enlisted Groundcrew | Abnormal | 6 | 4.3 | 6 | 4.0 | 5 | 3.9 | M vs. L | 0.92 (0.29,2.93) | 0.999 |
| | | Normal | 132 | 95.7 | 143 | 96.0 | 124 | 96.1 | H vs. L | 0.89 (0.26,2.98) | 0.999 |

TABLE B-27. (continued)

Unadjusted Exposure Index Analysis for Followup Participants
for Lifetime Occurrence of Malignant Neoplasms

| Variable | Occupation | Statistic | Exposure Index ^a | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|---|------------------------|-----------|-----------------------------|---------|--------|---------|--------|---------|----------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Sun-Exposure Related Malignancies (Verified Only) ^b | Officer | n | 125 | | 127 | | 121 | | Overall | | 0.625 |
| | | Abnormal | 9 | 7.2 | 13 | 10.2 | 9 | 7.4 | M vs. L | 1.47 (0.61, 3.57) | 0.504 |
| | | Normal | 116 | 92.8 | 114 | 89.8 | 112 | 92.6 | H vs. L | 1.04 (0.40, 2.70) | 0.999 |
| | Enlisted Flyer | n | 54 | | 61 | | 52 | | Overall | | 0.058 |
| | | Abnormal | 7 | 13.0 | 3 | 4.9 | 1 | 1.9 | M vs. L | 0.35 (0.09, 1.42) | 0.186 |
| | | Normal | 47 | 87.0 | 58 | 95.1 | 51 | 98.1 | H vs. L | 0.13 (0.02, 1.11) | 0.060 |
| | Enlisted Groundcrew | n | 138 | | 149 | | 129 | | Overall | | 0.910 |
| | | Abnormal | 5 | 3.6 | 7 | 4.7 | 5 | 3.9 | M vs. L | 1.31 (0.41, 4.23) | 0.772 |
| | | Normal | 133 | 96.4 | 142 | 95.3 | 124 | 96.1 | H vs. L | 1.07 (0.30, 3.80) | 0.999 |
| Sun-Exposure Related Malignancies (Verified and Suspected) ^b | Officer | n | 125 | | 127 | | 121 | | Overall | | 0.382 |
| | | Abnormal | 10 | 8.0 | 16 | 12.6 | 10 | 8.3 | M vs. L | 1.66 (0.72, 3.81) | 0.301 |
| | | Normal | 115 | 92.0 | 111 | 87.4 | 111 | 91.7 | H vs. L | 1.04 (0.42, 2.59) | 0.999 |
| | Enlisted Flyer | n | 54 | | 61 | | 52 | | Overall | | 0.058 |
| | | Abnormal | 7 | 13.0 | 3 | 4.9 | 1 | 1.9 | M vs. L | 0.35 (0.09, 1.42) | 0.186 |
| | | Normal | 47 | 87.0 | 58 | 95.1 | 51 | 98.1 | H vs. L | 0.13 (0.02, 1.11) | 0.060 |
| | Enlisted Groundcrew | n | 138 | | 149 | | 129 | | Overall | | 0.945 |
| | | Abnormal | 6 | 4.3 | 7 | 4.7 | 5 | 3.9 | M vs. L | 1.09 (0.36, 3.31) | 0.999 |
| | | Normal | 132 | 95.7 | 142 | 95.3 | 124 | 96.1 | H vs. L | 0.89 (0.26, 2.98) | 0.999 |

TABLE H-27. (continued)

Unadjusted Exposure Index Analysis for Followup Participants
for Lifetime Occurrence of Malignant Neoplasms

| Variable | Occupation | Statistic | Exposure Index ^a | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|---|----------------|-----------|-----------------------------|---------|--------|---------|--------|---------|----------------------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Systemic Malignancies (Verified Only) ^c | Officer | n | 127 | | 130 | | 123 | | Overall | | 0.876 |
| | | Abnormal | 2 | 1.6 | 3 | 2.3 | 3 | 2.4 | M vs. L | 1.48 (0.24, 8.99) | 0.999 |
| | | Normal | 125 | 98.4 | 127 | 97.7 | 120 | 97.6 | H vs. L | 1.56 (0.26, 9.52) | 0.680 |
| | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.825 |
| | | Abnormal | 2 | 3.6 | 2 | 3.1 | 1 | 1.8 | M vs. L | 0.84 (0.12, 6.18) | 0.999 |
| | | Normal | 53 | 96.4 | 63 | 96.9 | 56 | 98.2 | H vs. L | 0.47 (0.04, 5.37) | 0.615 |
| Enlisted Groundcrew | n | 154 | | 163 | | 142 | | Overall | | 0.205 | |
| | Abnormal | 0 | 0.0 | 3 | 1.8 | 1 | 0.7 | M vs. L | 6.74 (0.35, 131.53)* | 0.248 | |
| | Normal | 154 | 100.0 | 160 | 98.2 | 141 | 99.3 | H vs. L | 3.28 (0.13, 81.06)* | 0.480 | |
| Systemic Malignancies (Verified and Suspected) ^c | Officer | n | 127 | | 130 | | 123 | | Overall | | 0.730 |
| | | Abnormal | 2 | 1.6 | 4 | 3.1 | 3 | 2.4 | M vs. L | 1.98 (0.36, 11.03) | 0.684 |
| | | Normal | 125 | 98.4 | 126 | 96.9 | 120 | 97.6 | H vs. L | 1.56 (0.26, 9.52) | 0.680 |
| | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.784 |
| | | Abnormal | 3 | 5.5 | 2 | 3.1 | 2 | 3.5 | M vs. L | 0.55 (0.09, 3.42) | 0.660 |
| | | Normal | 52 | 94.5 | 63 | 96.9 | 55 | 96.5 | H vs. L | 0.63 (0.10, 3.93) | 0.676 |
| Enlisted Groundcrew | n | 154 | | 163 | | 142 | | Overall | | 0.261 | |
| | Abnormal | 0 | 0.0 | 3 | 1.8 | 2 | 1.4 | M vs. L | 6.74 (0.35, 131.53)* | 0.248 | |
| | Normal | 154 | 100.0 | 160 | 98.2 | 140 | 98.6 | H vs. L | 5.50 (0.26, 115.51)* | 0.229 | |

^aNumber and percent of total participants.^bNonblacks only.^cBlacks and nonblacks.

*0.5 added to each cell to calculate relative risk and confidence interval due to zero cell.

APPENDIX I

Neurological Assessment

APPENDIX I: Neurological Assessment

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TABLE I-1.

Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|---------------|---------------------|-----------|----------------|---------|--------|---------|--------|---------|----------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Smell | Officer | n | 127 | | 130 | | 123 | | Overall | | 0.361 |
| | | Abnormal | 2 | 1.6 | 0 | 0.0 | 1 | 0.8 | M vs. L | 0.19 (0.01,4.05)* | 0.243 |
| | | Normal | 125 | 98.4 | 130 | 100.0 | 122 | 99.2 | H vs. L | 0.51 (0.05,5.72) | 0.999 |
| | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.739 |
| | | Abnormal | 1 | 1.8 | 1 | 1.5 | 2 | 3.5 | M vs. L | 0.84 (0.05,13.81) | 0.999 |
| | | Normal | 54 | 98.2 | 64 | 98.5 | 55 | 96.5 | H vs. L | 1.96 (0.17,22.30) | 0.999 |
| | Enlisted Groundcrew | n | 154 | | 163 | | 142 | | Overall | | 0.995 |
| | | Abnormal | 1 | 0.7 | 1 | 0.6 | 1 | 0.7 | M vs. L | 0.94 (0.06,15.23) | 0.999 |
| | | Normal | 153 | 99.3 | 162 | 99.4 | 141 | 99.3 | H vs. L | 1.09 (0.07,17.51) | 0.999 |
| Visual Fields | Officer | n | 127 | | 130 | | 123 | | Overall | | 0.593 |
| | | Abnormal | 1 | 0.8 | 0 | 0.0 | 1 | 0.8 | M vs. L | 0.32 (0.01,8.01)* | 0.494 |
| | | Normal | 126 | 99.2 | 130 | 100.0 | 122 | 99.2 | H vs. L | 1.03 (0.06,16.70) | 0.999 |
| | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.328 |
| | | Abnormal | 1 | 1.8 | 0 | 0.0 | 0 | 0.0 | M vs. L | 0.28 (0.01,6.95)* | 0.458 |
| | | Normal | 54 | 98.2 | 65 | 100.0 | 57 | 100.0 | H vs. L | 0.32 (0.01,7.92)* | 0.491 |
| | Enlisted Groundcrew | n | 154 | | 163 | | 142 | | Overall | | 0.356 |
| | | Abnormal | 2 | 1.3 | 0 | 0.0 | 1 | 0.7 | M vs. L | 0.19 (0.01,3.92)* | 0.235 |
| | | Normal | 152 | 98.7 | 163 | 100.0 | 141 | 99.3 | H vs. L | 0.54 (0.05,6.01) | 0.999 |

TABLE I-1. (continued)

Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|---------------------|----------------|-----------|----------------|---------|--------|---------|--------|---------|-------------------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Light Reaction | Officer | n | 126 | | 130 | | 123 | | Overall | | 0.133 |
| | | Abnormal | 2 | 1.6 | 0 | 0.0 | 0 | 0.0 | M vs. L | 0.19 (0.01,4.01)* | 0.241 |
| | | Normal | 124 | 98.4 | 130 | 100.0 | 123 | 100.0 | H vs. L | 0.20 (0.01,4.24)* | 0.498 |
| | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.328 |
| | | Abnormal | 1 | 1.8 | 0 | 0.0 | 0 | 0.0 | M vs. L | 0.28 (0.01,6.95)* | 0.458 |
| | | Normal | 54 | 98.2 | 65 | 100.0 | 57 | 100.0 | H vs. L | 0.32 (0.01,7.92)* | 0.491 |
| Enlisted Groundcrew | n | 154 | | 163 | | 142 | | Overall | | 0.866 | |
| | Abnormal | 2 | 1.3 | 2 | 1.2 | 1 | 0.7 | M vs. L | 0.94 (0.13,6.79) | 0.999 | |
| | Normal | 152 | 98.7 | 161 | 98.8 | 141 | 99.3 | H vs. L | 0.54 (0.05,6.01) | 0.999 | |
| Ocular Movements | Officer | n | 127 | | 130 | | 123 | | Overall | | 0.368 |
| | | Abnormal | 1 | 0.8 | 0 | 0.0 | 0 | 0.0 | M vs. L | 0.32 (0.01,8.01)* | 0.494 |
| | | Normal | 126 | 99.2 | 130 | 100.0 | 123 | 100.0 | H vs. L | 0.34 (0.01,8.46)* | 0.999 |
| | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.612 |
| | | Abnormal | 1 | 1.8 | 1 | 1.5 | 0 | 0.0 | M vs. L | 0.84 (0.05,13.81) | 0.999 |
| | | Normal | 54 | 98.2 | 64 | 98.5 | 57 | 100.0 | H vs. L | 0.32 (0.01,7.92)* | 0.491 |
| Enlisted Groundcrew | n | 154 | | 163 | | 142 | | Overall | | 0.995 | |
| | Abnormal | 1 | 0.7 | 1 | 0.6 | 1 | 0.7 | M vs. L | 0.94 (0.06,15.23) | 0.999 | |
| | Normal | 153 | 99.3 | 162 | 99.4 | 141 | 99.3 | H vs. L | 1.09 (0.07,17.51) | 0.999 | |

TABLE I-1. (continued)
Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|---------------------|---------------------|-----------|----------------|---------|--------|---------|--------|---------|----------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Facial Sensation | Officer | n | 126 | | 130 | | 123 | | Overall | | 0.617 |
| | | Abnormal | 1 | 0.8 | 1 | 0.8 | 0 | 0.0 | M vs. L | 0.97 (0.06,15.66) | 0.999 |
| | | Normal | 125 | 99.2 | 129 | 99.2 | 123 | 100.0 | H vs. L | 0.34 (0.01,8.40)* | 0.999 |
| | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.328 |
| | | Abnormal | 1 | 1.8 | 0 | 0.0 | 0 | 0.0 | M vs. L | 0.28 (0.01,6.95)* | 0.458 |
| | | Normal | 54 | 98.2 | 65 | 100.0 | 57 | 100.0 | H vs. L | 0.32 (0.01,7.92)* | 0.491 |
| Corneal Reflex | Enlisted Groundcrew | n | 154 | | 163 | | 141 | | Overall | | 0.372 |
| | | Abnormal | 1 | 0.7 | 0 | 0.0 | 0 | 0.0 | M vs. L | 0.31 (0.01,7.74)* | 0.486 |
| | | Normal | 153 | 99.3 | 163 | 100.0 | 141 | 100.0 | H vs. L | 0.36 (0.02,8.95)* | 0.999 |
| | Officer | n | 125 | | 130 | | 123 | | Overall | | — |
| | | Abnormal | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | M vs. L | — | — |
| | | Normal | 125 | 100.0 | 130 | 100.0 | 123 | 100.0 | H vs. L | — | — |
| Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | — | |
| | Abnormal | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | M vs. L | — | — | |
| | Normal | 55 | 100.0 | 65 | 100.0 | 57 | 100.0 | H vs. L | — | — | |
| Enlisted Groundcrew | n | 152 | | 161 | | 142 | | Overall | | — | |
| | Abnormal | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | M vs. L | — | — | |
| | Normal | 152 | 100.0 | 161 | 100.0 | 142 | 100.0 | H vs. L | — | — | |

TABLE I-1. (continued)

Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|---------------------|----------------|-----------|----------------|---------|--------|---------|--------|---------|--------------------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Jaw Clench | Officer | n | 127 | | 130 | | 123 | | Overall | | 0.368 |
| | | Abnormal | 1 | 0.8 | 0 | 0.0 | 0 | 0.0 | M vs. L | 0.32 (0.01,8.01)* | 0.494 |
| | | Normal | 126 | 99.2 | 130 | 100.0 | 123 | 100.0 | H vs. L | 0.34 (0.01,8.46)* | 0.999 |
| | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.328 |
| | | Abnormal | 1 | 1.8 | 0 | 0.0 | 0 | 0.0 | M vs. L | 0.28 (0.01,6.95)* | 0.458 |
| | | Normal | 54 | 98.2 | 65 | 100.0 | 57 | 100.0 | H vs. L | 0.32 (0.01,7.92)* | 0.491 |
| Smile | Officer | n | 154 | | 163 | | 142 | | Overall | | — |
| | | Abnormal | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | M vs. L | — | — |
| | | Normal | 154 | 100.0 | 163 | 100.0 | 142 | 100.0 | H vs. L | — | — |
| | Enlisted Flyer | n | 127 | | 130 | | 123 | | Overall | | 0.618 |
| | | Abnormal | 1 | 0.8 | 1 | 0.8 | 0 | 0.0 | M vs. L | 0.98 (0.06,15.79) | 0.999 |
| | | Normal | 126 | 99.2 | 129 | 99.2 | 123 | 100.0 | H vs. L | 0.34 (0.01,8.46)* | 0.999 |
| Enlisted Groundcrew | n | 55 | | 65 | | 57 | | Overall | | 0.612 | |
| | Abnormal | 1 | 1.8 | 1 | 1.5 | 0 | 0.0 | M vs. L | 0.84 (0.05,13.81) | 0.999 | |
| | Normal | 54 | 98.2 | 64 | 98.5 | 57 | 100.0 | H vs. L | 0.32 (0.01,7.92)* | 0.491 | |
| Enlisted Groundcrew | n | 154 | | 163 | | 142 | | Overall | | 0.323 | |
| | Abnormal | 0 | 0.0 | 1 | 0.6 | 2 | 1.4 | M vs. L | 2.85 (0.12,70.55)* | 0.999 | |
| | Normal | 154 | 100.0 | 162 | 99.4 | 140 | 98.6 | H vs. L | 5.50 (0.26,115.5)* | 0.229 | |

TABLE I-1. (continued)
Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|--------------------|---------------------|-----------|----------------|---------|--------|---------|--------|---------|----------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Palpebral Fissures | Officer | n | 127 | | 130 | | 122 | | Overall | | 0.801 |
| | | Abnormal | 1 | 0.8 | 2 | 1.5 | 1 | 0.8 | M vs. L | 1.97 (0.18,21.99) | 0.999 |
| | | Normal | 126 | 99.2 | 128 | 98.5 | 121 | 99.2 | H vs. L | 1.04 (0.06,16.84) | 0.999 |
| | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.420 |
| | | Abnormal | 0 | 0.0 | 1 | 1.5 | 0 | 0.0 | M vs. L | 2.58 (0.10,64.65)* | 0.999 |
| | | Normal | 55 | 100.0 | 64 | 98.5 | 57 | 100.0 | H vs. L | — | — |
| Balance | Officer | n | 154 | | 163 | | 142 | | Overall | | 0.598 |
| | | Abnormal | 0 | 0.0 | 1 | 0.6 | 1 | 0.7 | M vs. L | 2.85 (0.12,70.55)* | 0.999 |
| | | Normal | 154 | 100.0 | 162 | 99.4 | 141 | 99.3 | H vs. L | 3.28 (0.13,81.06)* | 0.480 |
| | Enlisted Flyer | n | 127 | | 130 | | 123 | | Overall | | — |
| | | Abnormal | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | M vs. L | — | — |
| | | Normal | 127 | 100.0 | 130 | 100.0 | 123 | 100.0 | H vs. L | — | — |
| Groundcrew | Enlisted Flyer | n | 55 | | 64 | | 57 | | Overall | | — |
| | | Abnormal | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | M vs. L | — | — |
| | | Normal | 55 | 100.0 | 64 | 100.0 | 57 | 100.0 | H vs. L | — | — |
| | Enlisted Groundcrew | n | 154 | | 163 | | 142 | | Overall | | 0.574 |
| | | Abnormal | 1 | 0.7 | 0 | 0.0 | 1 | 0.7 | M vs. L | 0.31 (0.01,7.74)* | 0.486 |
| | | Normal | 153 | 99.3 | 163 | 100.0 | 141 | 99.3 | H vs. L | 1.09 (0.07,17.51)* | 0.999 |

TABLE I-1. (continued)

Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|---------------------|----------------|-----------|----------------|---------|--------|---------|--------|---------|-------------------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Gag Reflex | Officer | n | 126 | | 130 | | 123 | | Overall | | — |
| | | Abnormal | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | M vs. L | — | — |
| | | Normal | 126 | 100.0 | 130 | 100.0 | 123 | 100.0 | H vs. L | — | — |
| | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.328 |
| | | Abnormal | 1 | 1.8 | 0 | 0.0 | 0 | 0.0 | M vs. L | 0.28 (0.01,6.95)* | 0.458 |
| | | Normal | 54 | 98.2 | 65 | 100.0 | 57 | 100.0 | H vs. L | 0.32 (0.01,7.92)* | 0.491 |
| Enlisted Groundcrew | n | 153 | | 163 | | 142 | | Overall | | — | |
| | Abnormal | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | M vs. L | — | — | |
| | Normal | 153 | 100.0 | 163 | 100.0 | 142 | 100.0 | H vs. L | — | — | |
| Speech | Officer | n | 127 | | 130 | | 123 | | Overall | | — |
| | | Abnormal | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | M vs. L | — | — |
| | | Normal | 127 | 100.0 | 130 | 100.0 | 123 | 100.0 | H vs. L | — | — |
| | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.328 |
| | | Abnormal | 1 | 1.8 | 0 | 0.0 | 0 | 0.0 | M vs. L | 0.28 (0.01,6.95)* | 0.458 |
| | | Normal | 54 | 98.2 | 65 | 100.0 | 57 | 100.0 | H vs. L | 0.32 (0.01,7.92)* | 0.491 |
| Enlisted Groundcrew | n | 154 | | 163 | | 142 | | Overall | | 0.574 | |
| | Abnormal | 1 | 0.7 | 0 | 0.0 | 1 | 0.7 | M vs. L | 0.31 (0.01,7.74)* | 0.486 | |
| | Normal | 153 | 99.3 | 163 | 100.0 | 141 | 99.3 | H vs. L | 1.09 (0.07,17.51) | 0.999 | |

TABLE I-1. (continued)
Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|-------------------------------------|---------------------|-----------|----------------|---------|--------|---------|--------|---------|----------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Tongue Position Relative to Midline | Officer | n | 127 | | 130 | | 123 | | Overall | | 0.368 |
| | | Abnormal | 1 | 0.8 | 0 | 0.0 | 0 | 0.0 | M vs. L | 0.32 (0.01, 8.01)* | 0.494 |
| | | Normal | 126 | 99.2 | 130 | 100.0 | 123 | 100.0 | H vs. L | 0.34 (0.01, 8.46)* | 0.999 |
| | | n | 55 | | 65 | | 57 | | Overall | | 0.378 |
| | Enlisted Flyer | Abnormal | 1 | 1.8 | 0 | 0.0 | 0 | 0.0 | M vs. L | 0.28 (0.01, 6.95)* | 0.458 |
| | | Normal | 54 | 98.2 | 65 | 100.0 | 57 | 100.0 | H vs. L | 0.32 (0.01, 7.92)* | 0.491 |
| | Enlisted Groundcrew | n | 153 | | 163 | | 142 | | Overall | | 0.444 |
| | | Abnormal | 0 | 0.0 | 1 | 0.6 | 0 | 0.0 | M vs. L | 2.83 (0.12, 70.09)* | 0.999 |
| | | Normal | 153 | 100.0 | 162 | 99.4 | 142 | 100.0 | H vs. L | --- | --- |
| | | n | 126 | | 130 | | 123 | | Overall | | 0.365 |
| Palate and Uvula Movement | Officer | Abnormal | 1 | 0.8 | 0 | 0.0 | 0 | 0.0 | M vs. L | 0.32 (0.01, 7.94)* | 0.492 |
| | | Normal | 125 | 99.2 | 130 | 100.0 | 123 | 100.0 | H vs. L | 0.34 (0.01, 8.40)* | 0.999 |
| | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.328 |
| | | Abnormal | 1 | 1.8 | 0 | 0.0 | 0 | 0.0 | M vs. L | 0.28 (0.01, 6.95)* | 0.458 |
| | | Normal | 54 | 98.2 | 65 | 100.0 | 57 | 100.0 | H vs. L | 0.32 (0.01, 7.92)* | 0.491 |
| | | n | 153 | | 163 | | 142 | | Overall | | --- |
| | Enlisted Groundcrew | Abnormal | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | M vs. L | --- | --- |
| | | Normal | 153 | 100.0 | 163 | 100.0 | 142 | 100.0 | H vs. L | --- | --- |

TABLE I-1. (continued)

Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|------------------------------|---------------------|-----------|----------------|---------|--------|---------|--------|---------|----------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Neck Range of Motion | Officer | n | 127 | | 130 | | 123 | | Overall | | 0.924 |
| | | Abnormal | 9 | 7.1 | 9 | 6.9 | 10 | 8.1 | M vs. L | 0.98 (0.37, 2.54) | 0.999 |
| | Enlisted Flyer | Normal | 118 | 92.9 | 121 | 93.1 | 113 | 91.9 | H vs. L | 1.16 (0.46, 2.96) | 0.814 |
| | | n | 55 | | 65 | | 57 | | Overall | | 0.891 |
| | Enlisted Flyer | Abnormal | 5 | 9.1 | 6 | 9.2 | 4 | 7.0 | M vs. L | 1.02 (0.29, 3.53) | 0.999 |
| | | Normal | 50 | 90.9 | 59 | 90.8 | 53 | 93.0 | H vs. L | 0.76 (0.19, 2.97) | 0.740 |
| Cranial Nerve Function Index | Enlisted Groundcrew | n | 154 | | 163 | | 142 | | Overall | | 0.250 |
| | | Abnormal | 9 | 5.8 | 6 | 3.7 | 3 | 2.1 | M vs. L | 0.62 (0.21, 1.77) | 0.433 |
| | Officer | Normal | 145 | 94.2 | 157 | 96.3 | 139 | 97.9 | H vs. L | 0.35 (0.09, 1.31) | 0.142 |
| | | n | 122 | | 130 | | 123 | | Overall | | 0.734 |
| | Enlisted Flyer | Abnormal | 15 | 12.3 | 12 | 9.2 | 13 | 10.7 | M vs. L | 0.73 (0.33, 1.62) | 0.542 |
| | | Normal | 107 | 87.7 | 118 | 90.8 | 109 | 89.3 | H vs. L | 0.85 (0.39, 1.87) | 0.841 |
| Cranial Nerve Function Index | Enlisted Flyer | n | 55 | | 64 | | 57 | | Overall | | 0.754 |
| | | Abnormal | 7 | 12.7 | 8 | 12.5 | 5 | 8.8 | M vs. L | 0.98 (0.33, 2.90) | 0.999 |
| | Enlisted Groundcrew | Normal | 48 | 87.3 | 56 | 87.5 | 52 | 91.2 | H vs. L | 0.66 (0.20, 2.22) | 0.554 |
| | | n | 151 | | 161 | | 141 | | Overall | | 0.512 |
| | Enlisted Groundcrew | Abnormal | 15 | 9.9 | 12 | 7.5 | 9 | 6.4 | M vs. L | 0.73 (0.33, 1.62) | 0.546 |
| | | Normal | 136 | 90.1 | 149 | 92.5 | 132 | 93.6 | H vs. L | 0.62 (0.26, 1.46) | 0.290 |

TABLE I-1. (continued)

Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|--|---------------------|-----------|----------------|---------|--------|---------|--------|---------|----------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Cranial Nerve Function Index (Neck Range of Motion Excluded) | Officer | n | 122 | | 130 | | 122 | | Overall | | 0.136 |
| | | Abnormal | 8 | 6.6 | 3 | 2.3 | 3 | 2.5 | M vs. L | 0.34 (0.09,1.30) | 0.127 |
| | | Normal | 114 | 93.4 | 127 | 97.7 | 119 | 97.5 | H vs. L | 0.36 (0.09,1.39) | 0.216 |
| | Enlisted Flyer | n | 55 | | 64 | | 57 | | Overall | | 0.791 |
| | | Abnormal | 3 | 5.5 | 2 | 3.1 | 2 | 3.5 | M vs. L | 0.56 (0.09,3.47) | 0.661 |
| | | Normal | 52 | 94.5 | 62 | 96.9 | 55 | 96.5 | H vs. L | 0.63 (0.10,3.93) | 0.676 |
| | Enlisted Groundcrew | n | 151 | | 161 | | 141 | | Overall | | 0.785 |
| | | Abnormal | 8 | 5.3 | 6 | 3.7 | 7 | 5.0 | M vs. L | 0.69 (0.23,2.04) | 0.590 |
| | | Normal | 143 | 94.7 | 155 | 96.3 | 134 | 95.0 | H vs. L | 0.93 (0.33,2.65) | 0.999 |
| Pin Prick | Officer | n | 126 | | 127 | | 122 | | Overall | | 0.713 |
| | | Abnormal | 9 | 7.1 | 6 | 4.7 | 7 | 5.7 | M vs. L | 0.65 (0.22,1.87) | 0.440 |
| | | Normal | 117 | 92.9 | 121 | 95.3 | 115 | 94.3 | H vs. L | 0.79 (0.29,2.20) | 0.797 |
| | Enlisted Flyer | n | 55 | | 64 | | 57 | | Overall | | 0.584 |
| | | Abnormal | 5 | 9.1 | 3 | 4.7 | 5 | 8.8 | M vs. L | 0.49 (0.11,2.16) | 0.469 |
| | | Normal | 50 | 90.9 | 61 | 95.3 | 52 | 91.2 | H vs. L | 0.96 (0.26,3.52) | 0.999 |
| | Enlisted Groundcrew | n | 152 | | 162 | | 138 | | Overall | | 0.052 |
| | | Abnormal | 13 | 8.6 | 8 | 4.9 | 3 | 2.2 | M vs. L | 0.56 (0.22,1.38) | 0.259 |
| | | Normal | 139 | 91.4 | 154 | 95.1 | 135 | 97.8 | H vs. L | 0.24 (0.07,0.85) | 0.020 |

TABLE 11. (continued)

Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|---------------|---------------------|-----------|----------------|---------|--------|---------|--------|---------|----------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Light Touch | Officer | n | 126 | | 127 | | 122 | | Overall | | 0.141 |
| | | Abnormal | 9 | 7.1 | 4 | 3.2 | 3 | 2.5 | M vs. L | 0.42 (0.13,1.41) | 0.167 |
| | | Normal | 117 | 92.9 | 123 | 96.8 | 119 | 97.5 | H vs. L | 0.33 (0.09,1.24) | 0.137 |
| | Enlisted Flyer | n | 55 | | 64 | | 57 | | Overall | | 0.619 |
| | | Abnormal | 3 | 5.5 | 2 | 3.1 | 4 | 7.0 | M vs. L | 0.56 (0.09,3.47) | 0.661 |
| | | Normal | 52 | 94.5 | 62 | 96.9 | 53 | 93.0 | H vs. L | 1.31 (0.28,6.13) | 0.999 |
| Muscle Status | Enlisted Groundcrew | n | 152 | | 162 | | 138 | | Overall | | 0.834 |
| | | Abnormal | 5 | 3.3 | 5 | 3.1 | 3 | 2.2 | M vs. L | 0.94 (0.27,3.30) | 0.999 |
| | | Normal | 147 | 96.7 | 157 | 96.9 | 135 | 97.8 | H vs. L | 0.65 (0.15,2.79) | 0.725 |
| | Officer | n | 127 | | 130 | | 123 | | Overall | | 0.428 |
| | | Abnormal | 5 | 3.9 | 2 | 1.5 | 5 | 4.1 | M vs. L | 0.38 (0.07,2.00) | 0.278 |
| | | Normal | 122 | 96.1 | 128 | 98.5 | 118 | 95.9 | H vs. L | 1.03 (0.29,3.66) | 0.999 |
| Muscle Status | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.992 |
| | | Abnormal | 1 | 1.8 | 1 | 1.5 | 1 | 1.8 | M vs. L | 0.84 (0.05,13.81) | 0.999 |
| | | Normal | 54 | 98.2 | 64 | 98.5 | 56 | 98.2 | H vs. L | 0.96 (0.06,15.81) | 0.999 |
| | Enlisted Groundcrew | n | 154 | | 163 | | 142 | | Overall | | 0.781 |
| | | Abnormal | 3 | 2.0 | 5 | 3.1 | 3 | 2.1 | M vs. L | 1.59 (0.37,6.78) | 0.724 |
| | | Normal | 151 | 98.0 | 158 | 96.9 | 139 | 97.9 | H vs. L | 1.09 (0.22,5.47) | 0.999 |

TABLE I-1. (continued)
Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|---------------------|----------------|-----------|----------------|---------|--------|---------|--------|---------|---------------------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Vibratory Sensation | Officer | n | 126 | | 127 | | 122 | | Overall | | 0.542 |
| | | Abnormal | 3 | 2.4 | 1 | 0.8 | 3 | 2.5 | M vs. L | 0.33 (0.03, 3.17) | 0.370 |
| | | Normal | 123 | 97.6 | 126 | 99.2 | 119 | 97.5 | H vs. L | 1.03 (0.21, 5.22) | 0.999 |
| | Enlisted Flyer | n | 55 | | 64 | | 57 | | Overall | | 0.628 |
| | | Abnormal | 0 | 0.0 | 1 | 1.6 | 1 | 1.8 | M vs. L | 2.62 (0.11, 65.68)* | 0.999 |
| | | Normal | 55 | 100.0 | 63 | 98.4 | 56 | 98.2 | H vs. L | 2.95 (0.12, 73.90)* | 0.999 |
| Enlisted Groundcrew | n | 152 | | 162 | | 138 | | Overall | | 0.166 | |
| | Abnormal | 0 | 0.0 | 2 | 1.2 | 0 | 0.0 | M vs. L | 4.75 (0.23, 99.76)* | 0.499 | |
| | Normal | 152 | 100.0 | 160 | 98.8 | 138 | 100.0 | H vs. L | | | |
| Patellar Reflex | Officer | n | 127 | | 130 | | 123 | | Overall | | 0.156 |
| | | Abnormal | 0 | 0.0 | 1 | 0.8 | 3 | 2.4 | M vs. L | 2.95 (0.12, 73.18)* | 0.999 |
| | | Normal | 127 | 100.0 | 129 | 99.2 | 120 | 97.6 | H vs. L | 7.41 (0.38, 144.90)* | 0.118 |
| | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.992 |
| | | Abnormal | 1 | 1.8 | 1 | 1.5 | 1 | 1.8 | M vs. L | 0.84 (0.05, 13.81) | 0.999 |
| | | Normal | 54 | 98.2 | 64 | 98.5 | 56 | 98.2 | H vs. L | 0.96 (0.06, 15.81) | 0.999 |
| Enlisted Groundcrew | n | 154 | | 163 | | 142 | | Overall | | 0.170 | |
| | Abnormal | 3 | 2.0 | 0 | 0.0 | 1 | 0.7 | M vs. L | 0.13 (0.01, 2.58)* | 0.114 | |
| | Normal | 151 | 98.0 | 163 | 100.0 | 141 | 99.3 | H vs. L | 0.36 (0.04, 3.47) | 0.624 | |

TABLE I-1. (continued)

Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|-----------------|---------------------|-----------|----------------|---------|--------|---------|--------|---------|----------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Achilles Reflex | Officer | n | 124 | | 129 | | 123 | | Overall | | 0.774 |
| | | Abnormal | 8 | 6.5 | 6 | 4.7 | 8 | 6.5 | M vs. L | 0.71 (0.24, 2.10) | 0.591 |
| | | Normal | 116 | 93.5 | 123 | 95.3 | 115 | 93.5 | H vs. L | 1.01 (0.37, 2.78) | 0.999 |
| | Enlisted Flyer | n | 55 | | 64 | | 57 | | Overall | | 0.059 |
| | | Abnormal | 5 | 9.1 | 0 | 0.0 | 4 | 7.0 | M vs. L | 0.07 (0.004, 1.32)* | 0.019 |
| | | Normal | 50 | 90.9 | 64 | 100.0 | 53 | 93.0 | H vs. L | 0.76 (0.19, 2.97) | 0.740 |
| Biceps Reflex | Enlisted Groundcrew | n | 153 | | 163 | | 141 | | Overall | | 0.920 |
| | | Abnormal | 10 | 6.5 | 9 | 5.5 | 8 | 5.7 | M vs. L | 0.84 (0.33, 2.12) | 0.814 |
| | | Normal | 143 | 93.5 | 154 | 94.5 | 133 | 94.3 | H vs. L | 0.86 (0.33, 2.25) | 0.812 |
| | Officer | n | 127 | | 130 | | 123 | | Overall | | 0.344 |
| | | Abnormal | 1 | 0.8 | 0 | 0.0 | 2 | 1.6 | M vs. L | 0.32 (0.01, 8.01)* | 0.494 |
| | | Normal | 126 | 99.2 | 130 | 100.0 | 121 | 98.4 | H vs. L | 2.08 (0.19, 23.27) | 0.618 |
| Biceps Reflex | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.420 |
| | | Abnormal | 0 | 0.0 | 1 | 1.5 | 0 | 0.0 | M vs. L | 2.58 (0.10, 64.65) | 0.999 |
| | | Normal | 55 | 100.0 | 64 | 98.5 | 57 | 100.0 | H vs. L | — | — |
| | Enlisted Groundcrew | n | 154 | | 163 | | 142 | | Overall | | 0.515 |
| | | Abnormal | 1 | 0.7 | 3 | 1.8 | 1 | 0.7 | M vs. L | 2.87 (0.30, 27.88) | 0.623 |
| | | Normal | 153 | 99.3 | 160 | 98.2 | 141 | 99.3 | H vs. L | 1.09 (0.07, 17.51) | 0.999 |

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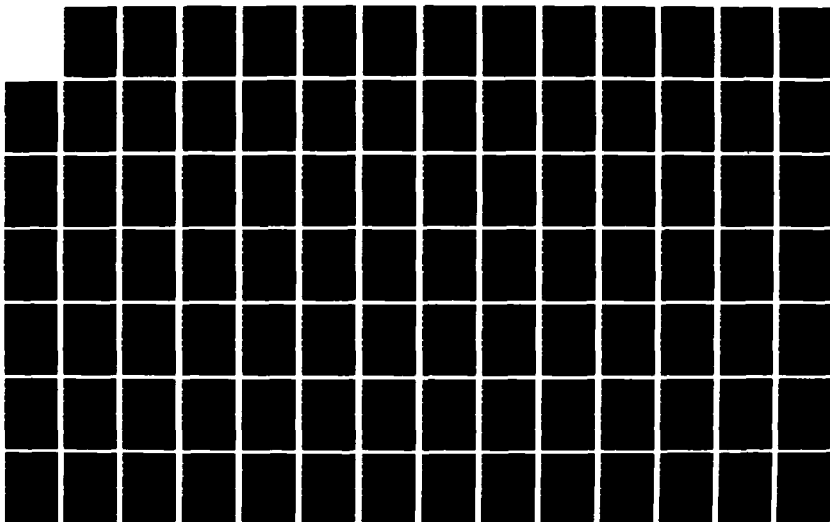
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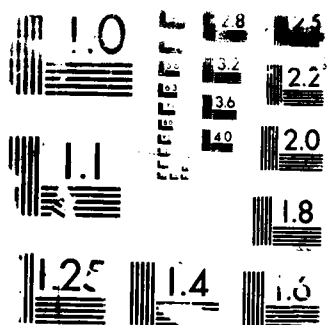
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RESOLUTION TEST CHART

TABLE I-1. (continued)
Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|---------------------|----------------|-----------|----------------|---------|--------|---------|--------|---------|-------------------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Babinski Reflex | Officer | n | 127 | | 128 | | 122 | | Overall | | — |
| | | Abnormal | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | M vs. L | — | — |
| | | Normal | 127 | 100.0 | 128 | 100.0 | 122 | 100.0 | H vs. L | — | — |
| | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | — |
| | | Abnormal | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | M vs. L | — | — |
| | | Normal | 55 | 100.0 | 65 | 100.0 | 57 | 100.0 | H vs. L | — | — |
| Enlisted Groundcrew | n | 153 | | 162 | | 142 | | Overall | | 0.329 | |
| | Abnormal | 2 | 1.3 | 0 | 0.0 | 2 | 1.4 | M vs. L | 0.19 (0.01,3.92)* | 0.235 | |
| | Normal | 151 | 98.7 | 162 | 100.0 | 140 | 98.6 | H vs. L | 1.08 (0.15,7.76) | 0.999 | |
| Tremor | Officer | n | 127 | | 130 | | 123 | | Overall | | 0.248 |
| | | Abnormal | 5 | 3.9 | 1 | 0.8 | 3 | 2.4 | M vs. L | 0.19 (0.02,1.64) | 0.117 |
| | | Normal | 122 | 96.1 | 129 | 99.2 | 120 | 97.6 | H vs. L | 0.61 (0.14,2.61) | 0.722 |
| | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.609 |
| | | Abnormal | 1 | 1.8 | 3 | 4.6 | 3 | 5.3 | M vs. L | 2.61 (0.26,25.86) | 0.624 |
| | | Normal | 54 | 98.2 | 62 | 95.4 | 54 | 94.7 | H vs. L | 3.00 (0.30,29.76) | 0.618 |
| Enlisted Groundcrew | n | 154 | | 163 | | 142 | | Overall | | 0.312 | |
| | Abnormal | 5 | 3.3 | 4 | 2.5 | 1 | 0.7 | M vs. L | 0.75 (0.20,2.85) | 0.744 | |
| | Normal | 149 | 96.7 | 159 | 97.5 | 141 | 99.3 | H vs. L | 0.21 (0.02,1.83) | 0.216 | |

TABLE I-1. (continued)

Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|--------------|---------------------|-----------|----------------|---------|--------|---------|--------|---------|----------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Coordination | Officer | n | 127 | | 130 | | 123 | | Overall | | 0.603 |
| | | Abnormal | 0 | 0.0 | 1 | 0.8 | 1 | 0.8 | M vs. L | 2.95 (0.12, 73.18)* | 0.999 |
| | | Normal | 127 | 100.0 | 129 | 99.2 | 122 | 99.2 | H vs. L | 3.12 (0.13, 77.39)* | 0.492 |
| | Enlisted Flyer | n | 55 | | 64 | | 57 | | Overall | | 0.415 |
| | | Abnormal | 0 | 0.0 | 1 | 1.6 | 0 | 0.0 | M vs. L | 2.62 (0.11, 65.68)* | 0.999 |
| | | Normal | 55 | 100.0 | 63 | 98.4 | 57 | 100.0 | H vs. L | — | — |
| Romberg Sign | Enlisted Groundcrew | n | 154 | | 163 | | 142 | | Overall | | 0.516 |
| | | Abnormal | 2 | 1.3 | 1 | 0.6 | 3 | 2.1 | M vs. L | 0.47 (0.04, 5.23) | 0.613 |
| | | Normal | 152 | 98.7 | 162 | 99.4 | 139 | 97.9 | H vs. L | 1.64 (0.27, 9.96) | 0.674 |
| | Officer | n | 127 | | 130 | | 123 | | Overall | | — |
| | | Abnormal | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | M vs. L | — | — |
| | | Normal | 127 | 100.0 | 130 | 100.0 | 123 | 100.0 | H vs. L | — | — |
| Romberg Sign | Enlisted Flyer | n | 55 | | 64 | | 57 | | Overall | | — |
| | | Abnormal | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | M vs. L | — | — |
| | | Normal | 55 | 100.0 | 64 | 100.0 | 57 | 100.0 | H vs. L | — | — |
| | Enlisted Groundcrew | n | 154 | | 163 | | 142 | | Overall | | 0.574 |
| | | Abnormal | 1 | 0.7 | 0 | 0.0 | 1 | 0.7 | M vs. L | 0.31 (0.01, 7.74) | 0.486 |
| | | Normal | 153 | 99.3 | 163 | 100.0 | 141 | 99.3 | H vs. L | 1.09 (0.07, 17.51) | 0.999 |

TABLE I-1. (continued)
Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|---------------------|---------------------|-----------|----------------|---------|--------|---------|--------|---------|-------------------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Gait | Officer | n | 127 | | 130 | | 123 | | Overall | | 0.591 |
| | | Abnormal | 3 | 2.4 | 1 | 0.8 | 2 | 1.6 | M vs. L | 0.32 (0.03, 3.12) | 0.366 |
| | | Normal | 124 | 97.6 | 129 | 99.2 | 121 | 98.4 | H vs. L | 0.68 (0.11, 4.16) | 0.999 |
| | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.370 |
| | | Abnormal | 2 | 3.6 | 2 | 3.1 | 0 | 0.0 | M vs. L | 0.84 (0.12, 6.18) | 0.999 |
| | | Normal | 53 | 96.4 | 63 | 96.9 | 57 | 100.0 | H vs. L | 0.19 (0.01, 3.97)* | 0.239 |
| Enlisted Groundcrew | n | 154 | | 163 | | 142 | | Overall | | 0.580 | |
| | Abnormal | 4 | 2.6 | 2 | 1.2 | 4 | 2.8 | M vs. L | 0.47 (0.08, 2.58) | 0.437 | |
| | Normal | 150 | 97.4 | 161 | 98.8 | 138 | 97.2 | H vs. L | 1.09 (0.27, 4.43) | 0.999 | |
| ONS Summary Index | Officer | n | 127 | | 130 | | 123 | | Overall | | 0.123 |
| | | Abnormal | 8 | 6.3 | 2 | 1.5 | 4 | 3.3 | M vs. L | 0.23 (0.05, 1.12) | 0.058 |
| | | Normal | 119 | 93.7 | 128 | 98.5 | 119 | 96.7 | H vs. L | 0.50 (0.15, 1.71) | 0.377 |
| | Enlisted Flyer | n | 55 | | 64 | | 57 | | Overall | | 0.810 |
| | | Abnormal | 3 | 5.5 | 5 | 7.8 | 3 | 5.3 | M vs. L | 1.47 (0.34, 6.45) | 0.724 |
| | | Normal | 52 | 94.5 | 59 | 92.2 | 54 | 94.7 | H vs. L | 0.96 (0.19, 4.99) | 0.999 |
| | Enlisted Groundcrew | n | 154 | | 163 | | 142 | | Overall | | 0.585 |
| | | Abnormal | 10 | 6.5 | 7 | 4.3 | 6 | 4.2 | M vs. L | 0.65 (0.24, 1.74) | 0.459 |
| | | Normal | 144 | 93.5 | 156 | 95.7 | 136 | 95.8 | H vs. L | 0.64 (0.23, 1.80) | 0.448 |

*Estimated relative risk and confidence interval calculated after adding 0.5 to each cell.

—No abnormalities present in contrast; estimated relative risk, confidence interval, and p-value not calculated.

TABLE I-2.
Interaction Summaries of Adjusted Exposure
Index Analyses for Selected Neurological Variables

| Variable | Interaction (Occupation) | Stratification | Statistic | Exposure Index | | | | | | Contrast | Adj. Relative Risk (95% C.I.) | p-Value |
|---------------------------------------|-----------------------------|----------------|-----------|----------------|---------|--------|---------|---------|--------------------|----------------------|----------------------------------|---------|
| | | | | Low | | Medium | | High | | | | |
| | | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Cranial Nerve Function Index | Diabetic | n | 7 | | 12 | | 14 | | Overall | | 0.339* | |
| | | Abnormal | 0 | 0.0 | 3 | 25.0 | 2 | 14.3 | H vs. L | 5.53 (0.25,124.40)** | 0.263* | |
| | | Normal | 7 | 100.0 | 9 | 75.0 | 12 | 85.7 | H vs. L | 3.00 (0.13,71.31)** | 0.533* | |
| | Impaired | n | 11 | | 14 | | 18 | | Overall | | 0.114* | |
| | | Abnormal | 0 | 0.0 | 2 | 14.3 | 0 | 0.0 | H vs. L | 4.60 (0.20,106.30)** | 0.487* | |
| | | Normal | 11 | 100.0 | 12 | 85.7 | 18 | 100.0 | H vs. L | — | — | |
| Light Touch | Normal ^a | n | 133 | | 135 | | 109 | | Overall | | 0.336 | |
| | | Abnormal | 15 | 11.3 | 7 | 5.2 | 7 | 6.4 | H vs. L | 0.55 (0.21,1.44) | 0.225 | |
| | | Normal | 118 | 88.7 | 128 | 94.8 | 102 | 93.6 | H vs. L | 0.56 (0.22,1.44) | 0.228 | |
| | Yes ^b | n | 38 | | 45 | | 40 | | Overall | | 0.086 | |
| | | Abnormal | 1 | 2.6 | 2 | 4.4 | 4 | 10.0 | H vs. L | 0.42 (0.02,8.81) | 0.573 | |
| | | Normal | 37 | 97.4 | 43 | 95.6 | 36 | 90.0 | H vs. L | 5.48 (0.41,71.54) | 0.194 | |
| No | n | 17 | | 19 | | 17 | | Overall | | 0.111* | | |
| | Abnormal | 2 | 11.8 | 0 | 0.0 | 0 | 0.0 | H vs. L | 0.16 (0.01,3.56)** | 0.216* | | |
| | Normal | 15 | 88.2 | 19 | 100.0 | 17 | 100.0 | H vs. L | 0.18 (0.01,3.98)** | 0.485* | | |

TABLE I-2. (continued)
Interaction Summaries of Adjusted Exposure
Index Analyses for Selected Neurological Variables

| Variable | Interaction (Occupation) | Stratification | Statistic | Exposure Index | | | | | | Contrast | Adj. Relative Risk (95% C.I.) | p-Value |
|------------------|-----------------------------|-------------------------|-----------|----------------|---------|--------|---------|---------|---------|---------------------|----------------------------------|---------|
| | | | | Low | | Medium | | High | | | | |
| | | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Muscle Status | Born ≥1942 | n | 87 | 1.1 | 129 | 1.6 | 82 | 0.0 | Overall | 1.35 (0.12, 15.17)* | 0.539* | |
| | | Abnormal | 1 | 98.9 | 2 | 98.4 | 0 | 100.0 | M vs. L | 0.35 (0.01, 8.70)** | 0.999* | |
| | | Normal | 86 | | 127 | | 82 | | H vs. L | | 0.999* | |
| | | Abnormal | 1 | 98.4 | 2 | 93.9 | 3 | 94.4 | M vs. L | 3.65 (0.37, 36.13)* | 0.271* | |
| | | Normal | 62 | | 31 | | 51 | | H vs. L | | 0.334* | |
| | | Abnormal | 1 | 75.0 | 0 | 0.0 | 0 | 100.0 | M vs. L | 0.18 (0.01, 5.68)** | 0.400* | |
| | Normal | 3 | | 0 | | 6 | | H vs. L | | 0.400* | | |
| | Achilles Reflex | Born ≥1942 ^b | n | 86 | 2.3 | 129 | 4.7 | 81 | 1.2 | Overall | 2.18 (0.43, 11.12) | 0.309 |
| | | | Abnormal | 2 | 97.7 | 6 | 95.3 | 1 | 98.8 | M vs. L | 0.57 (0.05, 6.37) | 0.346 |
| | | | Normal | 84 | | 123 | | 80 | | H vs. L | | 0.644 |
| | | | Abnormal | 5 | 92.1 | 2 | 93.9 | 6 | 88.9 | M vs. L | 1.40 (0.38, 5.19) | 0.624 |
| | | | Normal | 58 | | 31 | | 48 | | H vs. L | | 0.616 |
| Abnormal | | | 3 | 25.0 | 0 | 0.0 | 1 | 83.3 | M vs. L | 0.07 (0.003, 1.51)* | 0.999* | |
| Normal | | 1 | | 0 | | 5 | | H vs. L | | 0.190* | | |

TABLE I-2. (continued)
Interaction Summaries of Adjusted Exposure
Index Analyses for Selected Neurological Variables

| Variable | Interaction (Occupation) | Stratification | Statistic | Exposure Index | | | | | | Contrast | Adj. Relative Risk (95% C.I.) | p-Value |
|---------------------------------------|--------------------------------------|------------------|-----------|----------------|---------|--------|---------|--------|---------|----------|----------------------------------|---------|
| | | | | Low | | Medium | | High | | | | |
| | | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Central Nervous System Index | Exposure Index-by- Insecticide | Yes ^b | n | 102 | | 113 | | 95 | | Overall | | 0.560 |
| | | | Abnormal | 4 | 3.9 | 7 | 6.2 | 3 | 3.2 | M vs. L | 1.68 (0.48,5.95) | 0.419 |
| | | | Normal | 98 | 96.1 | 106 | 93.8 | 92 | 96.8 | H vs. L | 0.87 (0.19,3.99) | 0.853 |
| | Exposure (Enlisted Groundcrew) | No | n | 52 | | 50 | | 47 | | Overall | | 0.050* |
| | | | Abnormal | 6 | 11.5 | 0 | 0.0 | 3 | 6.4 | M vs. L | 0.07 (0.004,1.29)** | 0.027* |
| | | | Normal | 46 | 88.5 | 50 | 100.0 | 44 | 93.6 | H vs. L | 0.38 (0.10,1.54)* | 0.209* |

*Estimated relative risk or p-value, based on stratified tables.

**Estimated relative risk and confidence interval calculated after adding 0.5 to each cell.

—No abnormal participants present in contrast; adjusted relative risk, p-value, and confidence interval not presented.

^aResults adjusted for age.

^bResults adjusted for diabetic class.

Note: Small sample sizes may affect validity of overall p-value.

TABLE I-3.

**Exclusions and Missing Data
for Neurological Assessment by Group
(Original Comparisons Only)**

| Data Category | Group | | Total |
|--|------------|---------------------|-------|
| | Ranch Hand | Original Comparison | |
| Lifetime Alcohol History (Drink-years); Missing Data | 39 | 27 | 66 |
| Peripheral Edema (Exclusion Category for Pin Prick, Light Touch, and Ankle Vibration) | 13 | 12 | 25 |
| Diabetic Class (Missing Data) | 0 | 3 | 3 |
| Positive Syphilis Serology (RPR and FTA); Exclusion Category | 0 | 0 | 0 |

TABLE I-4.

Unadjusted Analyses for Verified Neurological
Diseases by Group*--1982-1985
(Original Comparisons Only)

| Disease Category | Group Abnormalities | | | | Total | p-Value** |
|--------------------------------------|---------------------|---------|---------------------|---------|-------|-----------|
| | Ranch Hand | | Original Comparison | | | |
| | Number | Percent | Number | Percent | | |
| Inflammatory Diseases | 0 | 0.0 | 0 | 0.0 | 0 | — |
| Hereditary and Degenerative Diseases | 2 | 0.2 | 0 | 0.0 | 2 | 0.500 |
| Peripheral Disorders | 18 | 1.8 | 20 | 2.1 | 38 | 0.626 |
| Disorders of the Eye | 5 | 0.5 | 5 | 0.5 | 10 | 0.999 |
| Disorders of the Ear | 6 | 0.6 | 6 | 0.6 | 12 | 0.999 |
| Other Disorders | 8 | 0.8 | 3 | 0.3 | 11 | 0.288 |

*Based on 1,016 Ranch Hands and 955 Original Comparisons; some participants may be classified in more than one category.

**Fisher's exact test.

TABLE I-5.

Unadjusted Analyses for Verified Neurological
Diseases by Group*--Baseline and First Followup Studies Combined
(Original Comparisons Only)

| Disease Category | Group Abnormalities | | | | Total | p-Value ^{*,a} |
|--------------------------------------|---------------------|---------|---------------------|---------|-------|------------------------|
| | Ranch Hand | | Original Comparison | | | |
| | Number | Percent | Number | Percent | | |
| Inflammatory Diseases | 3 | 0.3 | 2 | 0.2 | 5 | 0.999 |
| Hereditary and Degenerative Diseases | 2 | 0.2 | 3 | 0.3 | 5 | 0.678 |
| Peripheral Disorders | 23 | 2.3 | 27 | 2.8 | 50 | 0.475 |
| Disorders of the Eye | 16 | 1.6 | 16 | 1.7 | 32 | 0.861 |
| Disorders of the Ear | 24 | 2.4 | 26 | 2.7 | 50 | 0.668 |
| Other Disorders | 15 | 1.5 | 12 | 1.3 | 27 | 0.703 |

*Based on 1,016 Ranch Hands and 955 Original Comparisons; some participants may be classified in more than one category.

**Fisher's exact test.

^aGroup significance for patterns of disease: $p=0.702$.

TABLE I-6.

Unadjusted Analyses for Cranial Nerve
Function by Group (Original Comparisons Only)

| Variable | Cranial Nerve | Statistic | Group | | | | Est. Relative Risk (95% C.I.) | p-Value |
|--------------------|--|-----------|------------|---------|---------------------|---------|-------------------------------|---------|
| | | | Ranch Hand | | Original Comparison | | | |
| | | | Number | Percent | Number | Percent | | |
| Smell | I Olfactory | n | 1,016 | | 955 | | 1.05 (0.42,2.58) | 0.999 |
| | | Abnormal | 10 | 1.0 | 9 | 0.9 | | |
| | | Normal | 1,006 | 99.0 | 946 | 99.1 | | |
| Visual Fields | II Optic | n | 1,016 | | 955 | | 1.41 (0.40,5.02) | 0.754 |
| | | Abnormal | 6 | 0.6 | 4 | 0.4 | | |
| | | Normal | 1,010 | 99.4 | 951 | 99.6 | | |
| Light Reaction | III Oculomotor | n | 1,015 | | 954 | | 1.08 (0.39,2.98) | 0.999 |
| | | Abnormal | 8 | 0.8 | 7 | 0.7 | | |
| | | Normal | 1,007 | 99.2 | 947 | 99.3 | | |
| Ocular Movements | III Oculomotor IV Trochlear VI Abducens | n | 1,016 | | 955 | | 1.13 (0.34,3.71) | 0.999 |
| | | Abnormal | 6 | 0.6 | 5 | 0.5 | | |
| | | Normal | 1,010 | 99.4 | 950 | 99.5 | | |
| Facial Sensation | V Trigeminal | n | 1,014 | | 953 | | 1.88 (0.34,10.31) | 0.688 |
| | | Abnormal | 4 | 0.4 | 2 | 0.2 | | |
| | | Normal | 1,010 | 99.6 | 951 | 99.8 | | |
| Jaw Clench | V Trigeminal | n | 1,016 | | 955 | | 1.88 (0.17,20.79) | 0.999 |
| | | Abnormal | 2 | 0.2 | 1 | 0.1 | | |
| | | Normal | 1,014 | 99.8 | 954 | 99.9 | | |
| Smile | VII Facial | n | 1,016 | | 955 | | 3.31 (0.69,15.95) | 0.181 |
| | | Abnormal | 7 | 0.7 | 2 | 0.2 | | |
| | | Normal | 1,009 | 99.3 | 953 | 99.8 | | |
| Palpebral Fissures | VII Facial | n | 1,015 | | 955 | | 1.32 (0.42,4.17) | 0.775 |
| | | Abnormal | 7 | 0.7 | 5 | 0.5 | | |
| | | Normal | 1,008 | 99.3 | 950 | 99.5 | | |

TABLE I-6. (continued)

Unadjusted Analyses for Cranial Nerve
Function by Group (Original Comparisons Only)

| Variable | Cranial Nerve | Statistic | Group | | | | Est. Relative Risk (95% C.I.) | p-Value |
|-------------------------------------|------------------------|-----------|------------|---------|---------------------|---------|-------------------------------|---------|
| | | | Ranch Hand | | Original Comparison | | | |
| | | | Number | Percent | Number | Percent | | |
| Balance | VIII Acoustic | n | 1,015 | | 955 | | 1.88 (0.17,20.81) | 0.999 |
| | | Abnormal | 2 | 0.2 | 1 | 0.1 | | |
| | | Normal | 1,013 | 99.8 | 954 | 99.9 | | |
| Gag Reflex | IX Glossopharyngeal | n | 1,014 | | 955 | | 0.94 (0.06,15.08) | 0.999 |
| | | Abnormal | 1 | 0.1 | 1 | 0.1 | | |
| | | Normal | 1,013 | 99.9 | 954 | 99.9 | | |
| Speech | X Vagus | n | 1,016 | | 954 | | 6.59 (0.34,127.80)* | 0.250 |
| | | Abnormal | 3 | 0.3 | 0 | 0.0 | | |
| | | Normal | 1,013 | 99.7 | 954 | 100.0 | | |
| Tongue Position Relative to Midline | X Vagus | n | 1,015 | | 955 | | 6.61 (0.34,128.06)* | 0.250 |
| | | Abnormal | 3 | 0.3 | 0 | 0.0 | | |
| | | Normal | 1,012 | 99.7 | 955 | 100.0 | | |
| Palate and Uvula Movement | XI Spinal Accessory | n | 1,014 | | 955 | | 1.89 (0.17,20.83) | 0.999 |
| | | Abnormal | 2 | 0.2 | 1 | 0.1 | | |
| | | Normal | 1,012 | 99.8 | 954 | 99.9 | | |
| Neck Range of Motion | XII Hypoglossal | n | 1,016 | | 955 | | 0.89 (0.62,1.28) | 0.579 |
| | | Abnormal | 61 | 6.0 | 64 | 6.7 | | |
| | | Normal | 955 | 94.0 | 891 | 93.3 | | |
| Cranial Nerve Function Index | | n | 1,003 | | 941 | | 1.01 (0.75,1.37) | 0.939 |
| | | Abnormal | 96 | 9.6 | 89 | 9.5 | | |
| | | Normal | 907 | 90.4 | 852 | 90.5 | | |

TABLE I-6. (continued)

Unadjusted Analyses for Cranial Nerve
Function by Group (Original Comparisons Only)

| Variable | Cranial Nerve | Statistic | Group | | | | Est. Relative Risk (95% C.I.) | p-Value |
|--|---------------|-----------|------------|---------|---------------------|---------|-------------------------------|---------|
| | | | Ranch Hand | | Original Comparison | | | |
| | | | Number | Percent | Number | Percent | | |
| Cranial Nerve Function Index (Neck Range of Motion Excluded) | n | | 1,003 | | 941 | | | |
| | Abnormal | | 42 | 4.2 | 29 | 3.1 | 1.34 (0.85,2.23) | 0.226 |
| | Normal | | 961 | 95.8 | 912 | 96.9 | | |

*Estimated relative risk and confidence interval calculated after adding 0.5 to each cell.

TABLE I-7.

Adjusted Analyses for Selected Variables of Cranial
Nerve Function by Group (Original Comparisons Only)

| | | Group | | | | Adj. Relative Risk (95% C.I.) | p-Value | Covariate Remarks* |
|---|-----------|------------|---------|------------------------|---------|----------------------------------|---------|--|
| Variable | Statistic | Ranch Hand | | Original Comparison | | | | |
| | | Number | Percent | Number | Percent | | | |
| Neck Range of Motion | n | 1,016 | | 955 | | 0.92 (0.64,1.57) | 0.647 | AGE(p<0.001) |
| | Abnormal | 61 | 6.0 | 64 | 6.7 | | | |
| | Normal | 955 | 94.0 | 891 | 93.3 | | | |
| Cranial Nerve Function Index | n | 1,003 | | 941 | | 1.04 (0.76,1.41) | 0.812 | AGE(p<0.001) |
| | Abnormal | 96 | 9.6 | 89 | 9.5 | | | |
| | Normal | 907 | 90.4 | 852 | 90.5 | | | |
| Cranial Nerve Function Index (Neck Range of Motion Excluded) | n | 964 | | 911 | | 1.27 (0.77,2.12) | 0.350 | DIAB*INS(p=0.032) OCC*DRKYR(p=0.016) OCC*DIAB(p=0.032) |
| | Abnormal | 38 | 3.9 | 28 | 3.1 | | | |
| | Normal | 926 | 96.1 | 883 | 96.9 | | | |
| Alternative Model—Includes Missing Drink-Year Participants ^{a, b} | | | | | | | | |
| | n | 1,003 | | 938 | | 1.41 (0.86,2.32) | 0.170 | DIAB*INS(p=0.022) OCC*DIAB(p=0.027) |
| | Abnormal | 42 | 4.2 | 28 | 3.0 | | | |
| | Normal | 961 | 95.8 | 910 | 97.0 | | | |

*Abbreviations:

DIAB: diabetic class
 INS: insecticide exposure
 OCC: occupation
 DRKYR: drink-years

^aLifetime alcohol consumption (drink-years) not used as a covariate.

^b66 missing drink-year participants: 4/39 Ranch Hands abnormal; 0/27 Original Comparisons abnormal.

TABLE I-8.

Unadjusted Analyses for Peripheral Nerve Function by Group
(Original Comparisons Only)

| Variable | Statistic | Group | | | | Est. Relative Risk (95% C.I.) | p-Value |
|---------------------|-----------|------------|---------|---------------------|---------|-------------------------------|---------|
| | | Ranch Hand | | Original Comparison | | | |
| | | Number | Percent | Number | Percent | | |
| Pin Prick | n | 1,003 | | 943 | | 0.89 (0.62,1.28) | 0.573 |
| | Abnormal | 59 | 5.9 | 62 | 6.6 | | |
| | Normal | 944 | 94.1 | 881 | 93.4 | | |
| Light Touch | n | 1,003 | | 943 | | 1.09 (0.68,1.75) | 0.809 |
| | Abnormal | 38 | 3.8 | 33 | 3.5 | | |
| | Normal | 965 | 96.2 | 910 | 96.5 | | |
| Muscle Status | n | 1,016 | | 955 | | 0.94 (0.54,1.63) | 0.888 |
| | Abnormal | 26 | 2.6 | 26 | 2.7 | | |
| | Normal | 990 | 97.4 | 929 | 97.3 | | |
| Vibratory Sensation | n | 1,003 | | 943 | | 1.48 (0.57,3.84) | 0.482 |
| | Abnormal | 11 | 1.1 | 7 | 0.7 | | |
| | Normal | 992 | 98.9 | 936 | 99.3 | | |
| Patellar Reflex | n | 1,016 | | 954 | | 0.74 (0.33,1.63) | 0.547 |
| | Abnormal | 11 | 1.1 | 14 | 1.5 | | |
| | Normal | 1,005 | 98.9 | 940 | 98.5 | | |
| Achilles Reflex | n | 1,009 | | 950 | | 0.87 (0.60,1.26) | 0.510 |
| | Abnormal | 58 | 5.7 | 62 | 6.5 | | |
| | Normal | 951 | 94.3 | 888 | 93.5 | | |
| Biceps Reflex | n | 1,016 | | 955 | | 0.85 (0.34,2.09) | 0.819 |
| | Abnormal | 9 | 0.9 | 10 | 1.0 | | |
| | Normal | 1,007 | 99.1 | 945 | 99.0 | | |
| Babinski Reflex | n | 1,011 | | 951 | | 0.94 (0.24,3.77) | 0.999 |
| | Abnormal | 4 | 0.4 | 4 | 0.4 | | |
| | Normal | 1,007 | 99.6 | 947 | 99.6 | | |

TABLE I-9.

Adjusted Analyses for Selected Variables of
Peripheral Nerve Function by Group
(Original Comparisons Only)

| Variable | Statistic | Group | | Original Comparison | | Adj. Relative Risk (95% C.I.) | p-Value | Covariate Remarks* |
|-----------------|-----------|------------|------|---------------------|---------|-------------------------------|---------|--------------------|
| | | Ranch Bend | | Number | Percent | | | |
| Pin Prick | n | 1,003 | | 941 | | | | |
| | Abnormal | 59 | 5.9 | 61 | 6.5 | **** | **** | GRP*DIAB(p=0.001) |
| | Normal | 944 | 94.1 | 880 | 93.5 | | | AGE(p<0.001) |
| Light Touch | n | 964 | | 914 | | | | |
| | Abnormal | 37 | 3.8 | 31 | 3.4 | 1.12 (0.69,1.82) | 0.652 | AGE(p=0.049) |
| | Normal | 927 | 96.2 | 883 | 96.6 | | | DIAB(p=0.014) |
| Muscle Status | n | 977 | | 925 | | | | |
| | Abnormal | 25 | 2.6 | 24 | 2.6 | 1.04 (0.57,1.89) | 0.893 | DIAB*AGE(p=0.037) |
| | Normal | 952 | 97.4 | 901 | 97.4 | | | DIAB*INS(p=0.028) |
| Achilles Reflex | n | 1,009 | | 947 | | | | |
| | Abnormal | 58 | 5.7 | 61 | 6.4 | 0.92 (0.63,1.35) | 0.677 | AGE(p<0.001) |
| | Normal | 951 | 94.3 | 886 | 93.6 | | | DIAB(p<0.001) |

*Additional Abbreviation:

GRP: group

****Group-by-covariate interaction—adjusted relative risk, confidence interval, and p-value are not presented.

TABLE I-10.

Summary of Group-by-Diabetic Class
Interaction for Pin Prick
(Original Comparisons Only)

| Variable | Interaction | Stratification | Statistic | Group | | | Adj. Relative Risk (95% C.I.) | p-Value | |
|--------------------------|-------------|----------------|-----------|------------|---------|---------------------|-------------------------------|-------------------|-------|
| | | | | Ranch Hand | | Original Comparison | | | |
| | | | | Number | Percent | | | | |
| Pin Prick Diabetic Class | Abnormal | n | Abnormal | 76 | | 74 | | | |
| | | | | 13 | 17.1 | 7 | 9.5 | 2.03 (0.76, 5.43) | 0.161 |
| | | | | 63 | 82.9 | 67 | 90.5 | | |
| | | | | | | | | | |
| | Impaired | n | Abnormal | 105 | | 135 | | | |
| | | | | 1 | 1.0 | 14 | 10.4 | 0.08 (0.01, 0.61) | 0.015 |
| | | | | 104 | 99.0 | 121 | 89.6 | | |
| | | | | | | | | | |
| | Normal | n | Abnormal | 822 | | 732 | | | |
| | | | | 45 | 5.5 | 40 | 5.5 | 1.01 (0.65, 1.57) | 0.951 |
| | | | | 777 | 94.5 | 692 | 94.5 | | |
| | | | | | | | | | |

TABLE I-11.

Unadjusted Analyses for CNS Coordination Variables by Group
(Original Comparisons Only)

| Variable | Statistic | Group | | | | Est. Relative Risk (95% C.I.) | p-Value |
|-------------------------|-----------|------------|---------|------------------------|---------|----------------------------------|---------|
| | | Ranch Hand | | Original Comparison | | | |
| | | Number | Percent | Number | Percent | | |
| Tremor | n | 1,016 | | 955 | | | |
| | Abnormal | 26 | 2.6 | 14 | 1.5 | 1.77 (0.92,3.40) | 0.110 |
| | Normal | 990 | 97.4 | 941 | 98.5 | | |
| Coordination | n | 1,015 | | 955 | | | |
| | Abnormal | 9 | 0.9 | 7 | 0.7 | 1.21 (0.45,3.27) | 0.804 |
| | Normal | 1,006 | 99.1 | 948 | 99.3 | | |
| Romberg Sign | n | 1,015 | | 955 | | | |
| | Abnormal | 2 | 0.2 | 1 | 0.1 | 1.88 (0.17,20.81) | 0.999 |
| | Normal | 1,013 | 99.8 | 954 | 99.9 | | |
| Gait | n | 1,016 | | 954 | | | |
| | Abnormal | 20 | 2.0 | 11 | 1.2 | 1.72 (0.82,3.61) | 0.153 |
| | Normal | 996 | 98.0 | 943 | 98.8 | | |
| CNS Summary Index | n | 1,015 | | 954 | | | |
| | Abnormal | 48 | 4.7 | 29 | 3.0 | 1.58 (0.99,2.53) | 0.062 |
| | Normal | 967 | 95.3 | 925 | 97.0 | | |

TABLE I-12.
Adjusted Analyses for Selected Variables of
CNS Coordination by Group (Original Comparisons Only)

| Variable | Statistic | Group | | Original Comparison | Adj. Relative Risk (95% C.I.) | p-Value | Covariate Remarks |
|-------------------------|--------------------|----------------------|-------------|------------------------|----------------------------------|-------------------------|----------------------|
| | | Ranch Hand Number | Percent | Number | Percent | | |
| Tremor | n | 1,016 | | 952 | | | |
| | Abnormal Normal | 26 990 | 2.6 97.4 | 14 938 | 1.5 98.5 | 1.68 (0.87, 3.25) 0.112 | DIAB(p=0.002) |
| Gait | n | 1,016 | | 951 | | | |
| | Abnormal Normal | 20 996 | 2.0 98.0 | 10 941 | 1.1 98.9 | 1.85 (0.86, 3.99) 0.105 | DIAB(p=0.035) |
| CNS Summary Index | n | 1,015 | | 951 | | | |
| | Abnormal Normal | 48 967 | 4.7 95.3 | 28 923 | 2.9 97.1 | 1.58 (0.98, 2.55) 0.055 | DIAB(p=0.009) |

TABLE I-13.

Longitudinal Analysis of Romberg Sign and Babinski Reflex:
A Contrast of Baseline and Followup Examination Abnormalities
(Original Comparisons Only)

| Variable | Group | 1982 Baseline Exam | 1985 Followup Exam | | Odds Ratio (OR)* | p-Value (OR _{RH} vs OR _{OC}) |
|--------------------|------------------------|--------------------------|--------------------------|------------|---------------------|--|
| | | | Abnormal | Normal | | |
| Romberg Sign | Ranch | Abnormal | 2 | 188 | 0 | 0.31 |
| | Hand | Normal | 0 | 777 | | |
| | Original Comparison | Abnormal Normal | 0 1 | 180 690 | 0.006 | |
| Babinski Reflex | Ranch | Abnormal | 1 | 7 | 0.43 | 0.07 |
| | Hand | Normal | 3 | 953 | | |
| | Original Comparison | Abnormal Normal | 0 4 | 1 863 | 4.00 | |

*Odds Ratio:
$$\frac{\text{Number Normal Baseline, Abnormal Followup}}{\text{Number Abnormal Baseline, Normal Followup}}$$

APPENDIX J

Psychological Assessment

APPENDIX J: Psychological Assessment

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TABLE J-1.

Summary of Kolmogorov-Smirnov Tests on MMPI for Officers

| Parameter* | Group | Mean Score | Standard Deviation | Kolmogorov- Smirnov p-Value |
|----------------------------|--------------------------|----------------|-----------------------|-----------------------------------|
| Anxiety | Ranch Hand Comparison | 52.82 53.64 | 7.38 7.77 | 0.281 |
| Consistency | Ranch Hand Comparison | 49.23 49.23 | 6.92 6.62 | 0.995 |
| Defensiveness | Ranch Hand Comparison | 49.64 49.61 | 6.64 6.97 | 0.990 |
| Denial | Ranch Hand Comparison | 59.47 59.81 | 7.31 7.46 | 0.877 |
| Depression | Ranch Hand Comparison | 55.11 55.27 | 10.17 10.28 | 0.999 |
| Hypochondria | Ranch Hand Comparison | 55.60 55.02 | 8.85 8.76 | 0.970 |
| Hysteria | Ranch Hand Comparison | 60.45 59.97 | 7.00 7.47 | 0.627 |
| Mania/Hypomania | Ranch Hand Comparison | 54.36 53.39 | 8.94 9.12 | 0.092 |
| Masculinity/ Femininity | Ranch Hand Comparison | 58.83 58.10 | 8.64 9.07 | 0.366 |
| Paranoia | Ranch Hand Comparison | 53.71 53.91 | 7.34 7.34 | 0.975 |
| Psychopathic/ Deviate | Ranch Hand Comparison | 56.82 57.08 | 8.87 10.02 | 0.837 |
| Schizophrenia | Ranch Hand Comparison | 54.80 55.14 | 8.48 9.02 | 0.942 |
| Social Introversion | Ranch Hand Comparison | 46.56 47.19 | 7.43 7.77 | 0.594 |
| Validity | Ranch Hand Comparison | 0.93 0.89 | 3.11 3.20 | 0.776 |

*n=380 Ranch Hands; n=480 Comparisons (except for validity, where n=483 Comparisons).

TABLE J-2.

Summary of Kolmogorov-Smirnov Tests on MMPI for Enlisted Flyers

| Parameter* | Group | Mean Score | Standard Deviation | Kolmogorov- Smirnov p-Value |
|----------------------------|--------------------------|----------------|-----------------------|-----------------------------------|
| Anxiety | Ranch Hand Comparison | 54.78 55.09 | 9.73 10.09 | 0.678 |
| Consistency | Ranch Hand Comparison | 52.24 51.83 | 10.30 8.22 | 0.995 |
| Defensiveness | Ranch Hand Comparison | 53.05 52.00 | 7.96 8.31 | 0.270 |
| Denial | Ranch Hand Comparison | 55.95 56.95 | 8.73 8.50 | 0.807 |
| Depression | Ranch Hand Comparison | 58.21 58.32 | 11.79 11.86 | 0.744 |
| Hypochondria | Ranch Hand Comparison | 58.48 59.25 | 12.16 12.85 | 0.496 |
| Hysteria | Ranch Hand Comparison | 60.00 61.32 | 8.94 9.47 | 0.366 |
| Mania/Hypomania | Ranch Hand Comparison | 55.05 54.99 | 10.00 9.87 | 0.496 |
| Masculinity/ Femininity | Ranch Hand Comparison | 55.79 56.57 | 7.85 8.46 | 0.776 |
| Paranoia | Ranch Hand Comparison | 52.77 51.92 | 8.43 7.83 | 0.695 |
| Psychopathic/ Deviate | Ranch Hand Comparison | 57.48 58.95 | 11.40 10.79 | 0.088 |
| Schizophrenia | Ranch Hand Comparison | 56.56 57.06 | 13.03 11.49 | 0.178 |
| Social Introversion | Ranch Hand Comparison | 50.35 49.48 | 8.89 8.14 | 0.678 |
| Validity | Ranch Hand Comparison | 3.93 6.31 | 42.48 54.96 | 0.864 |

*n=176 Ranch Hands; n=208 Comparisons (except for validity, where n=177 Ranch Hands and n=210 Comparisons).

TABLE J-3.

Summary of Kolmogorov-Smirnov Tests on MMPI
for Enlisted Groundcrew

| Parameter* | Group | Mean Score | Standard Deviation | Kolmogorov- Smirnov p-Value |
|----------------------------|--------------------------|----------------|-----------------------|-----------------------------------|
| Anxiety | Ranch Hand Comparison | 55.86 55.61 | 10.96 9.58 | 0.993 |
| Consistency | Ranch Hand Comparison | 53.05 52.03 | 10.64 8.43 | 0.877 |
| Defensiveness | Ranch Hand Comparison | 52.42 52.60 | 8.27 8.35 | 0.970 |
| Denial | Ranch Hand Comparison | 55.53 56.52 | 8.57 8.88 | 0.118 |
| Depression | Ranch Hand Comparison | 58.79 57.66 | 12.98 10.78 | 0.594 |
| Hypochondria | Ranch Hand Comparison | 58.44 57.13 | 13.22 11.12 | 0.142 |
| Hysteria | Ranch Hand Comparison | 60.36 59.78 | 9.80 8.99 | 0.577 |
| Mania/Hypomania | Ranch Hand Comparison | 55.26 56.33 | 9.78 10.17 | 0.450 |
| Masculinity/ Femininity | Ranch Hand Comparison | 56.18 57.18 | 8.24 8.82 | 0.292 |
| Paranoia | Ranch Hand Comparison | 53.12 53.73 | 9.05 8.47 | 0.393 |
| Psychopathic/ Deviate | Ranch Hand Comparison | 59.01 59.26 | 11.29 10.66 | 0.728 |
| Schizophrenia | Ranch Hand Comparison | 58.20 57.36 | 14.22 11.12 | 0.837 |
| Social Introversion | Ranch Hand Comparison | 51.86 50.43 | 9.82 8.71 | 0.107 |
| Validity | Ranch Hand Comparison | 1.97 0.89 | 26.48 4.80 | 0.999 |

*n=458 Ranch Hands; n=598 Comparisons (except for validity, where n=459 Ranch Hands and n=599 Comparisons).

TABLE J-4.

Summary of Group-by-Covariate Interactions
for Psychological Variables

| Variable | Interaction | Stratification | Statistic | Group | | Adj. Relative Risk (95% C.I.) | p-Value |
|-------------|---------------------------|----------------|--------------------------------|------------|------------|-------------------------------|---------|
| | | | | Ranch Hand | Comparison | | |
| Anxiety | Group by- Education | High School | n | 564 | 685 | | |
| | | | Number/% Abnormal Normal | 57 507 | 49 636 | 7.2% 92.8% | 0.114 |
| | | College | n | 448 | 600 | | |
| | | | Number/% Abnormal Normal | 16 432 | 30 570 | 5.0% 95.0% | 0.233 |
| Consistency | Group-by- Education | High School | n | 537 | 661 | | |
| | | | Number/% Abnormal Normal | 30 507 | 19 642 | 2.9% 97.5% | 0.051 |
| | | College | n | 437 | 585 | | |
| | | | Number/% Abnormal Normal | 6 431 | 15 570 | 2.6% 97.4% | 0.110 |
| Depression | Group-by- Combat Index | Low | n | 192 | 490 | | |
| | | | Number/% Abnormal Normal | 28 164 | 40 450 | 8.2% 91.8% | 0.039 |
| | | Medium | n | 368 | 417 | | |
| | | | Number/% Abnormal Normal | 37 331 | 38 379 | 9.1% 90.9% | 0.657 |
| | | High | n | 414 | 339 | | |
| | | | Number/% Abnormal Normal | 43 371 | 47 292 | 13.9% 86.1% | 0.159 |

TABLE J-4. (continued)
Summary of Group-by-Covariate Interactions
for Psychological Variables

| Variable | Interaction | Stratification | Statistic | Group | | Adj. Relative Risk (95% C.I.) | p-Value |
|---------------------|-----------------------|----------------|-------------------|------------|------------|-------------------------------|---------|
| | | | | Ranch Hand | Comparison | | |
| Paranoia | Group-by Age | Born ≥1942 | n | 410 | 545 | | |
| | | | Number/% Abnormal | 15 | 19 | | |
| | | Born <1942 | Normal | 395 | 526 | 0.88 (0.43, 1.77) | 0.712 |
| | | | | | | 3.5% 96.5% | |
| Schizophrenia | Group-by Education | High School | n | 602 | 740 | | |
| | | | Number/% Abnormal | 16 | 9 | | |
| | | College | Normal | 586 | 731 | 2.63 (1.11, 6.20) | 0.027 |
| | | | | | | 1.2% 98.8% | |
| | | College | n | 537 | 665 | | |
| | | | Number/% Abnormal | 72 | 63 | 1.51 (1.05, 2.16) | 0.033 |
| Social Introversion | Group-by Combat Index | Low | Normal | 465 | 602 | 9.5% 90.5% | |
| | | | n | 439 | 585 | | |
| | | | Number/% Abnormal | 18 | 37 | 0.63 (0.35, 1.12) | 0.119 |
| | | | Normal | 421 | 548 | 6.3% 93.7% | |
| | | Medium | n | 198 | 509 | | |
| | | | Number/% Abnormal | 11 | 6 | 4.86 (1.77, 13.36) | 0.002 |
| | | | Normal | 187 | 503 | 1.2% 98.8% | |
| | | | n | 384 | 427 | | |
| | | High | Number/% Abnormal | 6 | 4 | 1.59 (0.44, 5.68) | 0.478 |
| | | | Normal | 378 | 423 | 0.9% 99.1% | |
| | | | n | 430 | 349 | | |
| | | | Number/% Abnormal | 9 | 9 | 0.82 (0.32, 2.09) | 0.677 |
| | | | Normal | 421 | 340 | 2.6% 97.4% | |

TABLE J-4. (continued)
Summary of Group-by-Covariate Interactions
for Psychological Variables

| Variable | Interaction | Stratification | Statistic | Group | | Adj. Relative Risk (95% C.I.) | p-Value |
|--------------|--------------------|----------------|---------------|----------------|----------------|-------------------------------|---------|
| | | | | Ranch Hand | Comparison | | |
| Validity | Group-by-Race | Nonblack | n | 954 | 1,206 | | |
| | | | Number/% | | | | |
| | | | >0 | 208 | 21.8% | 19.5% | 0.095 |
| | | | 0 | 746 | 78.2% | 80.5% | |
| | | Black | n | 60 | 83 | | |
| | | | Number/% | | | | |
| | | | >0 | 15 | 25.0% | 42.2% | 0.038 |
| | | | 0 | 45 | 75.0% | 57.8% | |
| Total CMI | Group-by-Education | High School | n | 529 | 655 | | |
| | | | Number/% | | | | |
| | | | Adj. Mean* | 37.18 | 31.43 | -- | <0.001 |
| | | | 95% C.I.* | (30.25, 45.65) | (25.46, 38.76) | | |
| | | College | n | 433 | 574 | | |
| | | | Number/% | | | | |
| | | | Adj. Mean* | 23.72 | 24.22 | -- | 0.657 |
| | | | 95% C.I.* | (19.10, 29.41) | (19.57, 29.91) | | |
| M-R Subscore | Group-by-Education | High School | n | 555 | 675 | Overall: | 0.030 |
| | | | Number/% | | | Medium vs. Low | |
| | | | 0 (Low) | 246 | 44.3% | 1.37 (1.07, 1.75) | 0.014 |
| | | | 1-10 (Medium) | 267 | 48.1% | High vs. Low | |
| | | College | n | 443 | 590 | Overall: | 0.254 |
| | | | Number/% | | | Medium vs. Low | |
| | | | 0 (Low) | 292 | 65.9% | 0.91 (0.70, 1.18) | 0.699 |
| | | | 1-10 (Medium) | 141 | 31.8% | High vs. Low | 0.465 |
| | | | >10 (High) | 10 | 2.3% | 0.80 (0.35, 1.84) | 0.597 |

*Transformed from log(X+1) scale, where X was the number of questions answered "yes."
--No relative risk given for Total CMI, which was analyzed as a continuous variable.

TABLE J-5.

Summary of Kolmogorov-Smirnov Tests on CMI

| Stratification | Group | Sample Size | Mean Score | Standard Deviation | Kolmogorov-Smirnov p-Value |
|----------------------------|------------|-------------|------------|--------------------|----------------------------|
| <u>Age</u> | | | | | |
| Born ≥ 1942 | Ranch Hand | 402 | 15.88 | 15.21 | <0.001 |
| | Comparison | 543 | 13.07 | 12.40 | |
| Born 1923-1941 | Ranch Hand | 562 | 15.49 | 12.99 | 0.281 |
| | Comparison | 674 | 14.64 | 12.52 | |
| Born ≤ 1922 | Ranch Hand | 36 | 18.56 | 15.94 | 0.970 |
| | Comparison | 51 | 16.57 | 9.27 | |
| <u>Race</u> | | | | | |
| Nonblack | Ranch Hand | 941 | 15.63 | 13.83 | 0.003 |
| | Comparison | 1,187 | 13.94 | 12.00 | |
| Black | Ranch Hand | 59 | 17.81 | 16.91 | 0.481 |
| | Comparison | 81 | 15.68 | 17.01 | |
| <u>Education</u> | | | | | |
| High School | Ranch Hand | 556 | 18.88 | 15.80 | <0.001 |
| | Comparison | 677 | 15.77 | 13.50 | |
| College | Ranch Hand | 444 | 11.85 | 10.18 | 0.999 |
| | Comparison | 591 | 12.08 | 10.63 | |
| <u>Current Alcohol Use</u> | | | | | |
| Drinker | Ranch Hand | 851 | 15.16 | 13.12 | 0.024 |
| | Comparison | 1,092 | 13.72 | 12.00 | |
| Nondrinker | Ranch Hand | 148 | 18.84 | 17.71 | 0.149 |
| | Comparison | 176 | 16.06 | 14.38 | |
| <u>Occupation</u> | | | | | |
| Officer | Ranch Hand | 377 | 11.23 | 9.01 | 0.807 |
| | Comparison | 476 | 10.88 | 9.09 | |
| Enlisted Flyer | Ranch Hand | 174 | 17.72 | 14.84 | 0.220 |
| | Comparison | 204 | 15.63 | 13.53 | |
| Enlisted Groundcrew | Ranch Hand | 449 | 18.80 | 16.06 | 0.007 |
| | Comparison | 588 | 16.06 | 13.69 | |

TABLE J-6.

Unadjusted Exposure Index Analyses for Psychological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|-------------|------------------------|--------------------------------|-----------------------|-----------------------|----------------------|--------------------|---|----------------|
| | | | Low | Medium | High | | | |
| Anxiety | Officer | n | 127 | 130 | 123 | Overall | | 0.876 |
| | | Number/% Abnormal Normal | 2 1.6% 125 98.4% | 3 2.3% 127 97.7% | 3 2.4% 120 97.6% | M vs. L H vs. L | 1.48 (0.24, 8.99) 1.56 (0.26, 9.52) | 0.999 0.680 |
| | Enlisted Flyer | n | 54 | 65 | 57 | Overall | | 0.211 |
| | | Number/% Abnormal Normal | 8 14.8% 46 85.2% | 4 6.2% 61 93.8% | 4 7.0% 53 93.0% | M vs. L H vs. L | 0.38 (0.11, 1.33) 0.43 (0.12, 1.54) | 0.137 0.230 |
| | Enlisted Groundcrew | n | 154 | 163 | 141 | Overall | | 0.560 |
| | | Number/% Abnormal Normal | 19 12.3% 135 87.7% | 18 11.0% 145 89.0% | 12 8.5% 129 91.5% | M vs. L H vs. L | 0.88 (0.44, 1.75) 0.66 (0.31, 1.42) | 0.730 0.343 |
| Consistency | Officer | n | 127 | 130 | 123 | Overall | | 0.380 |
| | | Number/% Abnormal Normal | 2 1.6% 125 98.4% | 2 1.5% 128 98.5% | 0 0.0% 123 100.0% | M vs. L H vs. L | 0.98 (0.14, 7.04) 0.20 (0.01, 4.28)* | 0.999 0.498 |
| | Enlisted Flyer | n | 54 | 65 | 57 | Overall | | 0.476 |
| | | Number/% Abnormal Normal | 4 7.4% 50 92.6% | 2 3.1% 63 96.9% | 2 3.5% 55 96.5% | M vs. L H vs. L | 0.40 (0.07, 2.26) 0.46 (0.08, 2.59) | 0.409 0.430 |
| | Enlisted Groundcrew | n | 154 | 163 | 141 | Overall | | 0.813 |
| | | Number/% Abnormal Normal | 9 5.8% 145 94.2% | 9 5.5% 154 94.5% | 6 4.3% 135 95.7% | M vs. L H vs. L | 0.94 (0.36, 2.44) 0.72 (0.25, 2.01) | 0.999 0.603 |

TABLE J-6. (continued)

Unadjusted Exposure Index Analyses for Psychological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|---------------------|----------------|-----------|----------------|--------|------|----------|-------------------------------|---------------------|
| | | | Low | Medium | High | | | |
| Officer | | n | 127 | 130 | 123 | Overall | | 0.603 |
| | | Number/% | | | | | | |
| | | Abnormal | 0 | 0.0% | 1 | 0.8% | M vs. L | 2.95 (0.12, 73.18)* |
| Defensiveness | Enlisted Flyer | Normal | 127 | 100.0% | 129 | 99.2% | H vs. L | 3.12 (0.13, 77.39)* |
| | | n | 54 | 65 | 57 | Overall | | 0.991 |
| | | Number/% | | | | | | |
| | | Abnormal | 1 | 1.9% | 1 | 1.5% | M vs. L | 0.83 (0.05, 13.56) |
| | | Normal | 53 | 98.1% | 64 | 98.5% | H vs. L | 0.95 (0.06, 15.52) |
| Enlisted Groundcrew | | n | 154 | 163 | 141 | Overall | | 0.697 |
| | | Number/% | | | | | | |
| | | Abnormal | 6 | 3.9% | 5 | 3.1% | M vs. L | 0.78 (0.23, 2.61) |
| | | Normal | 148 | 96.1% | 158 | 96.9% | H vs. L | 1.29 (0.42, 3.93) |
| Officer | | n | 127 | 130 | 123 | Overall | | 0.094 |
| | | Number/% | | | | | | |
| | | Abnormal | 6 | 4.7% | 2 | 1.5% | M vs. L | 0.32 (0.06, 1.59) |
| Denial | Enlisted Flyer | Normal | 121 | 95.3% | 128 | 98.5% | H vs. L | 0.17 (0.02, 1.39) |
| | | n | 54 | 65 | 57 | Overall | | 0.366 |
| | | Number/% | | | | | | |
| | | Abnormal | 2 | 3.7% | 2 | 3.1% | M vs. L | 0.83 (0.11, 6.06) |
| | | Normal | 52 | 96.3% | 63 | 96.9% | H vs. L | 0.18 (0.01, 3.89)* |
| Enlisted Groundcrew | | n | 154 | 163 | 141 | Overall | | 0.326 |
| | | Number/% | | | | | | |
| | | Abnormal | 2 | 1.3% | 0 | 0.0% | M vs. L | 0.19 (0.01, 3.92)* |
| | | Normal | 152 | 98.7% | 163 | 100.0% | H vs. L | 1.09 (0.15, 7.87) |

TABLE J-6. (continued)

Unadjusted Exposure Index Analyses for Psychological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|--------------|---------------------|-------------------|----------------|-----------|-----------|----------|-------------------------------|---------|
| | | | Low | Medium | High | | | |
| Depression | Officer | n | 127 | 130 | 123 | Overall | | 0.517 |
| | | Number/% Abnormal | 8 6.3% | 6 4.6% | 10 8.1% | M vs. L | 0.72 (0.24, 2.14) | 0.593 |
| | | Normal | 119 93.7% | 124 95.4% | 113 91.9% | H vs. L | 1.32 (0.50, 3.45) | 0.631 |
| Depression | Enlisted Flyer | n | 54 | 65 | 57 | Overall | | 0.223 |
| | | Number/% Abnormal | 11 20.4% | 7 10.8% | 6 10.5% | M vs. L | 0.47 (0.17, 1.32) | 0.199 |
| | | Normal | 43 79.6% | 58 89.2% | 51 89.5% | H vs. L | 0.46 (0.16, 1.35) | 0.191 |
| Depression | Enlisted Groundcrew | n | 154 | 163 | 141 | Overall | | 0.695 |
| | | Number/% Abnormal | 25 16.2% | 21 12.9% | 20 14.2% | M vs. L | 0.76 (0.41, 1.43) | 0.428 |
| | | Normal | 129 83.8% | 142 87.1% | 121 85.8% | H vs. L | 0.85 (0.45, 1.62) | 0.746 |
| Hypochondria | Officer | n | 127 | 130 | 123 | Overall | | 0.530 |
| | | Number/% Abnormal | 10 7.9% | 6 4.6% | 9 7.3% | M vs. L | 0.57 (0.20, 1.61) | 0.312 |
| | | Normal | 117 92.1% | 124 95.4% | 114 92.7% | H vs. L | 0.92 (0.36, 2.36) | 0.999 |
| Hypochondria | Enlisted Flyer | n | 54 | 65 | 57 | Overall | | 0.059 |
| | | Number/% Abnormal | 11 20.4% | 4 6.2% | 10 17.5% | M vs. L | 0.26 (0.08, 0.86) | 0.026 |
| | | Normal | 43 79.6% | 61 93.8% | 47 82.5% | H vs. L | 0.83 (0.32, 2.15) | 0.810 |
| Hypochondria | Enlisted Groundcrew | n | 154 | 163 | 141 | Overall | | 0.176 |
| | | Number/% Abnormal | 25 16.2% | 18 11.0% | 26 18.4% | M vs. L | 0.64 (0.33, 1.23) | 0.192 |
| | | Normal | 129 83.8% | 145 89.0% | 115 81.6% | H vs. L | 1.17 (0.64, 2.13) | 0.646 |

TABLE J-6. (continued)

Unadjusted Exposure Index Analyses for Psychological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|-----------------|---------------------|-----------|----------------|-----------|-----------|----------|-------------------------------|---------|
| | | | Low | Medium | High | | | |
| Hysteria | Officer | n | 127 | 130 | 123 | Overall | | 0.200 |
| | | Number/% | | | | | | |
| | | Abnormal | 7 5.5% | 9 6.9% | 14 11.4% | M vs. L | 1.28 (0.46, 3.53) | 0.797 |
| | Enlisted Flyer | Normal | 120 94.5% | 121 93.1% | 109 88.6% | H vs. L | 2.20 (0.86, 5.66) | 0.113 |
| | | n | 54 | 65 | 57 | Overall | | 0.198 |
| | | Number/% | | | | | | |
| Mania/Hypomania | Enlisted Flyer | Abnormal | 11 20.4% | 6 9.2% | 7 12.3% | M vs. L | 0.40 (0.14, 1.16) | 0.115 |
| | | Normal | 43 79.6% | 59 90.8% | 50 87.7% | H vs. L | 0.55 (0.20, 1.54) | 0.307 |
| | Enlisted Groundcrew | n | 154 | 163 | 141 | Overall | | 0.065 |
| | | Number/% | | | | | | |
| | | Abnormal | 28 18.2% | 16 9.8% | 25 17.7% | M vs. L | 0.49 (0.25, 0.95) | 0.035 |
| | | Normal | 126 81.8% | 147 90.2% | 116 82.3% | H vs. L | 0.97 (0.54, 1.76) | 0.999 |
| Mania/Hypomania | Officer | n | 127 | 130 | 123 | Overall | | 0.585 |
| | | Number/% | | | | | | |
| | | Abnormal | 8 6.3% | 5 3.9% | 8 6.5% | M vs. L | 0.60 (0.19, 1.87) | 0.407 |
| | Enlisted Flyer | Normal | 119 93.7% | 125 96.1% | 115 93.5% | H vs. L | 1.04 (0.38, 2.85) | 0.999 |
| | | n | 54 | 65 | 57 | Overall | | 0.623 |
| | | Number/% | | | | | | |
| Mania/Hypomania | Enlisted Flyer | Abnormal | 3 5.6% | 6 9.2% | 6 10.5% | M vs. L | 1.73 (0.41, 7.27) | 0.509 |
| | | Normal | 51 94.4% | 59 90.8% | 51 89.5% | H vs. L | 2.00 (0.47, 8.44) | 0.491 |
| | Enlisted Groundcrew | n | 154 | 163 | 141 | Overall | | 0.568 |
| | | Number/% | | | | | | |
| | | Abnormal | 11 7.1% | 10 6.1% | 6 4.3% | M vs. L | 0.85 (0.35, 2.06) | 0.823 |
| | | Normal | 143 92.9% | 153 93.9% | 135 95.7% | H vs. L | 0.58 (0.21, 1.61) | 0.326 |

TABLE J-6. (continued)

Unadjusted Exposure Index Analyses for Psychological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|----------------------------|------------------------|-------------------|----------------|-----------|-----------|----------|-------------------------------|---------|
| | | | Low | Medium | High | | | |
| Officer | Officer | n | 127 | 130 | 123 | Overall | | 0.142 |
| | | Number/% Abnormal | 7 5.5% | 15 11.5% | 15 12.2% | M vs. L | 2.24 (0.88, 5.68) | 0.118 |
| | | Normal | 120 94.5% | 115 88.5% | 108 87.8% | H vs. L | 2.38 (0.94, 6.06) | 0.075 |
| Masculinity/ Femininity | Enlisted Flyer | n | 54 | 65 | 57 | Overall | | 0.478 |
| | | Number/% Abnormal | 1 1.9% | 4 6.2% | 2 3.5% | M vs. L | 3.48 (0.38, 32.06) | 0.375 |
| | | Normal | 53 98.1% | 61 93.8% | 55 96.5% | H vs. L | 1.93 (0.17, 21.89) | 0.999 |
| Enlisted Groundcrew | Enlisted Groundcrew | n | 154 | 163 | 141 | Overall | | 0.360 |
| | | Number/% Abnormal | 10 6.5% | 5 3.1% | 7 5.0% | M vs. L | 0.46 (0.15, 1.37) | 0.189 |
| | | Normal | 144 93.5% | 158 96.9% | 134 95.0% | H vs. L | 0.75 (0.28, 2.03) | 0.625 |
| Officer | Officer | n | 127 | 130 | 123 | Overall | | 0.194 |
| | | Number/% Abnormal | 1 0.8% | 1 0.8% | 4 3.3% | M vs. L | 0.98 (0.06, 15.79) | 0.999 |
| | | Normal | 126 99.2% | 129 99.2% | 119 96.7% | H vs. L | 4.24 (0.47, 38.44) | 0.208 |
| Paranoia | Enlisted Flyer | n | 54 | 65 | 57 | Overall | | 0.447 |
| | | Number/% Abnormal | 3 5.6% | 1 1.5% | 3 5.3% | M vs. L | 0.27 (0.03, 2.63) | 0.328 |
| | | Normal | 51 94.4% | 64 98.5% | 54 94.7% | H vs. L | 0.94 (0.18, 4.90) | 0.999 |
| Enlisted Groundcrew | Enlisted Groundcrew | n | 154 | 163 | 141 | Overall | | 0.735 |
| | | Number/% Abnormal | 5 3.3% | 6 3.7% | 7 5.0% | M vs. L | 1.14 (0.34, 3.81) | 0.999 |
| | | Normal | 149 96.7% | 157 96.3% | 134 95.0% | H vs. L | 1.56 (0.48, 5.02) | 0.560 |

TABLE J-6. (continued)

Unadjusted Exposure Index Analyses for Psychological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | Contrast | Est. Relative Risk (95% C.I.) | p Value |
|-----------------------|---------------------|-------------------|----------------|-----------|-----------|----------|-------------------------------|---------|
| | | | Low | Medium | High | | | |
| Officer | Officer | n | 127 | 130 | 123 | Overall | | 0.545 |
| | | Number/% Abnormal | 9 7.1% | 7 5.4% | 11 8.9% | M vs. L | 0.75 (0.27, 2.07) | 0.614 |
| | | Normal | 118 92.9% | 123 94.6% | 112 91.1% | H vs. L | 1.29 (0.51, 3.23) | 0.646 |
| Psychopathic/ Deviate | Enlisted Flyer | n | 54 | 65 | 57 | Overall | | 0.593 |
| | | Number/% Abnormal | 8 14.8% | 11 16.9% | 6 10.5% | M vs. L | 1.17 (0.43, 3.16) | 0.806 |
| | | Normal | 46 85.2% | 54 83.1% | 51 89.5% | H vs. L | 0.68 (0.22, 2.10) | 0.574 |
| Enlisted Groundcrew | Enlisted Groundcrew | n | 154 | 163 | 141 | Overall | | 0.220 |
| | | Number/% Abnormal | 25 16.2% | 18 11.0% | 25 17.7% | M vs. L | 0.64 (0.33, 1.23) | 0.192 |
| | | Normal | 129 83.8% | 145 89.0% | 116 82.3% | H vs. L | 1.11 (0.61, 2.04) | 0.758 |
| Officer | Officer | n | 127 | 130 | 123 | Overall | | 0.546 |
| | | Number/% Abnormal | 5 3.9% | 4 3.1% | 2 1.6% | M vs. L | 0.78 (0.20, 2.95) | 0.747 |
| | | Normal | 122 96.1% | 126 96.9% | 121 98.4% | H vs. L | 0.40 (0.08, 2.12) | 0.447 |
| Schizophrenia | Enlisted Flyer | n | 54 | 65 | 57 | Overall | | 0.519 |
| | | Number/% Abnormal | 8 14.8% | 6 9.2% | 5 8.8% | M vs. L | 0.59 (0.19, 1.80) | 0.400 |
| | | Normal | 46 85.2% | 59 90.8% | 52 91.2% | H vs. L | 0.55 (0.17, 1.81) | 0.385 |
| Enlisted Groundcrew | Enlisted Groundcrew | n | 154 | 163 | 141 | Overall | | 0.600 |
| | | Number/% Abnormal | 18 11.7% | 25 15.3% | 21 14.9% | M vs. L | 1.37 (0.71, 2.62) | 0.413 |
| | | Normal | 136 88.3% | 138 84.7% | 120 85.1% | H vs. L | 1.32 (0.67, 2.60) | 0.492 |

TABLE J-6. (continued)
Unadjusted Exposure Index Analyses for Psychological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|---------------------|---------------------|-------------------|----------------|-----------|------------|----------|-------------------------------|---------|
| | | | Low | Medium | High | | | |
| Social Introversion | Officer | n | 127 | 130 | 123 | Overall | | 0.385 |
| | | Number/% Abnormal | 1 0.8% | 2 1.5% | 0 0.0% | M vs. L | 1.97 (0.18, 21.99) | 0.999 |
| | Enlisted Flyer | Normal | 126 99.2% | 128 98.5% | 123 100.0% | H vs. L | 0.34 (0.01, 8.46)* | 0.999 |
| | | n | 54 | 65 | 57 | Overall | | 0.696 |
| | | Number/% Abnormal | 2 3.7% | 1 1.5% | 1 1.8% | M vs. L | 0.41 (0.04, 4.61) | 0.590 |
| Validity | Enlisted Groundcrew | Normal | 52 96.3% | 64 98.5% | 56 98.2% | H vs. L | 0.46 (0.04, 5.27) | 0.611 |
| | | n | 154 | 163 | 141 | Overall | | 0.635 |
| | Officer | Number/% Abnormal | 8 5.2% | 5 3.1% | 6 4.3% | M vs. L | 0.58 (0.19, 1.81) | 0.403 |
| | | Normal | 146 94.8% | 158 96.9% | 135 95.7% | H vs. L | 0.81 (0.27, 2.40) | 0.788 |
| | | n | 127 | 130 | 123 | Overall | | 0.052 |
| Validity | Enlisted Flyer | Number/% >0 | 32 25.2% | 34 26.2% | 18 14.6% | M vs. L | 1.05 (0.60, 1.84) | 0.887 |
| | | 0 | 95 74.8% | 96 73.8% | 105 85.4% | H vs. L | 0.51 (0.27, 0.97) | 0.041 |
| | Enlisted Groundcrew | n | 55 | 65 | 57 | Overall | | 0.310 |
| | | Number/% Abnormal | 10 18.2% | 8 12.3% | 13 22.8% | M vs. L | 0.63 (0.23, 1.73) | 0.445 |
| | | Normal | 45 81.8% | 57 87.7% | 44 77.2% | H vs. L | 1.33 (0.53, 3.35) | 0.642 |
| Validity | Enlisted Groundcrew | n | 154 | 163 | 142 | Overall | | 0.802 |
| | | Number/% >0 | 34 22.1% | 39 23.9% | 36 25.4% | M vs. L | 1.11 (0.66, 1.87) | 0.790 |
| | Enlisted Groundcrew | 0 | 120 77.9% | 124 76.1% | 106 74.6% | H vs. L | 1.20 (0.70, 2.05) | 0.584 |

TABLE J-6. (continued)
Unadjusted Exposure Index Analyses for Psychological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|-----------------------------|---------------------|-------------------|----------------|----------------|----------------|----------|-------------------------------|---------|
| | | | Low | Medium | High | | | |
| Total Cornell Medical Index | Officer | n | 126 | 128 | 123 | Overall | | 0.049 |
| | | Mean** | 7.99 | 8.55 | 10.04 | M vs. L | -- | 0.506 |
| | | 95% C.I.** | (6.84, 9.31) | (7.52, 9.69) | (8.99, 11.20) | H vs. L | -- | 0.018 |
| Enlisted Flyer | Enlisted Flyer | n | 53 | 65 | 56 | Overall | | 0.906 |
| | | Mean** | 13.69 | 13.13 | 13.96 | M vs. L | -- | 0.784 |
| | | 95% C.I.** | (10.63, 17.56) | (11.16, 15.42) | (11.51, 16.88) | H vs. L | -- | 0.906 |
| Enlisted Groundcrew | Enlisted Groundcrew | n | 153 | 159 | 137 | Overall | | 0.304 |
| | | Mean** | 14.46 | 13.03 | 14.92 | M vs. L | -- | 0.252 |
| | | 95% C.I.** | (12.64, 16.52) | (11.57, 14.65) | (13.05, 17.05) | H vs. L | -- | 0.745 |
| Officer | Officer | n | 125 | 128 | 121 | Overall | | 0.247 |
| | | Number/% >0 | 41 32.8% | 37 28.9% | 47 38.8% | M vs. L | 0.83 (0.49, 1.42) | 0.586 |
| | | 0 | 84 67.2% | 91 71.1% | 74 61.2% | H vs. L | 1.30 (0.77, 2.19) | 0.353 |
| Enlisted Flyer | Enlisted Flyer | n | 53 | 65 | 56 | Overall | | 0.400 |
| | | Number/% Abnormal | 22 41.5% | 35 53.8% | 26 46.4% | M vs. L | 1.64 (0.79, 3.42) | 0.200 |
| | | Normal | 31 58.5% | 30 46.2% | 30 53.6% | H vs. L | 1.22 (0.57, 2.61) | 0.700 |
| Enlisted Groundcrew | Enlisted Groundcrew | n | 154 | 157 | 139 | Overall | | 0.592 |
| | | Number/% >0 | 91 59.1% | 87 55.4% | 74 53.2% | M vs. L | 0.86 (0.55, 1.35) | 0.567 |
| | | 0 | 63 40.9% | 70 44.6% | 65 46.8% | H vs. L | 0.79 (0.50, 1.25) | 0.346 |

TABLE J-6. (continued)

Unadjusted Exposure Index Analyses for Psychological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|----------------------|---------------------|-----------|----------------|----------|----------|----------|-------------------------------|---------|
| | | | Low | Medium | High | | | |
| A-H Area Subscore | Officer | n | 113 | 112 | 114 | Overall | | 0.980 |
| | | Number/% | | | | | | |
| | | >0 | 57 50.4% | 56 50.0% | 56 49.1% | M vs. L | 0.98 (0.58,1.66) | 0.999 |
| A-H Area Subscore | Enlisted Flyer | n | 50 | 60 | 50 | Overall | | 0.946 |
| | | Number/% | | | | | | |
| | | >0 | 33 66.0% | 39 65.0% | 34 68.0% | M vs. L | 0.96 (0.43,2.11) | 0.999 |
| A-H Area Subscore | Enlisted Groundcrew | n | 136 | 150 | 129 | Overall | | 0.557 |
| | | Number/% | | | | | | |
| | | >0 | 93 68.4% | 96 64.0% | 90 69.8% | M vs. L | 0.82 (0.50,1.34) | 0.455 |
| HRB Impairment Index | Officer | n | 126 | 130 | 121 | Overall | | 0.401 |
| | | Number/% | | | | | | |
| | | Abnormal | 29 23.0% | 31 23.9% | 21 17.4% | M vs. L | 1.05 (0.59,1.87) | 0.884 |
| HRB Impairment Index | Enlisted Flyer | n | 52 | 65 | 57 | Overall | | 0.253 |
| | | Number/% | | | | | | |
| | | Abnormal | 20 38.5% | 35 53.9% | 27 47.4% | M vs. L | 1.87 (0.89,3.92) | 0.136 |
| HRB Impairment Index | Enlisted Groundcrew | n | 153 | 163 | 139 | Overall | | 0.272 |
| | | Number/% | | | | | | |
| | | Abnormal | 64 41.8% | 72 44.2% | 49 35.3% | M vs. L | 1.10 (0.71,1.72) | 0.733 |
| HRB Impairment Index | Enlisted Groundcrew | n | 89 | 91 | 90 | Overall | | 0.280 |
| | | Number/% | | | | | | |
| | | Abnormal | 58 65.2% | 55 60.5% | 64 71.1% | M vs. L | 0.76 (0.47,1.22) | 0.280 |

*Estimated relative risk and confidence interval calculated after adding 0.5 to each cell.

**Converted from log (X+1) scale, where X was the number of questions answered "yes."

--No relative risk given for Total Cornell Medical Index, which was analyzed as a continuous variable.

TABLE J-7.

Interaction Summaries of Adjusted Exposure Index Analyses for Psychological Variables

| Variable | Interaction (Occupation) | Stratification | Statistic | Exposure Index | | | Contrast | Adj. Relative Risk (95% C.I.) | p-Value |
|----------|---|-----------------------|-----------|----------------|--------|------|----------------|----------------------------------|---------|
| | | | | Low | Medium | High | | | |
| Anxiety | Exposure Index-by- Race | Nonblack | n | 138 | 149 | 128 | Overall | | 0.932* |
| | | | Number/% | | | | | | |
| | | | Abnormal | 14 | 10.1% | 12 | 9.4% M vs. L | 1.07 (0.50, 2.27)* | 0.999* |
| | | | Normal | 124 | 89.9% | 116 | 90.6% H vs. L | 0.92 (0.41, 2.06)* | 0.999* |
| | | Black | n | 16 | 14 | 13 | Overall | | 0.074* |
| | | | Number/% | | | | | | |
| Denial | Exposure Index-by- Age (Officer) | Born >=1942 | n | 43 | 22 | 11 | Overall | | 0.455* |
| | | | Number/% | | | | | | |
| | | | Abnormal | 2 | 4.7% | 0 | 0.0% M vs. L | 0.37 (0.02, 8.02)** | 0.545* |
| | | | Normal | 41 | 95.3% | 11 | 100.0% H vs. L | 0.72 (0.03, 16.12)** | 0.999* |
| | | Born 1923- 1941(a) | n | 79 | 93 | 109 | Overall | | 0.337 |
| | | | Number/% | | | | | | |
| Anxiety | Exposure Index-by- Age (Officer) | Born <=1922 | n | 5 | 15 | 3 | Overall | | 0.558* |
| | | | Number/% | | | | | | |
| | | | Abnormal | 1 | 20.0% | 0 | 0.0% M vs. L | 0.29 (0.01, 5.66)* | 0.447* |
| | | | Normal | 4 | 80.0% | 3 | 100.0% H vs. L | 0.43 (0.01, 14.08)** | 0.999* |
| | | Born 1923- 1941(a) | n | 76 | 92 | 108 | Overall | | 0.238 |
| | | | Number/% | | | | | | |

TABLE J-7. (continued)

Interaction Summaries of Adjusted Exposure Index Analyses for Psychological Variables

| Variable | Interaction (Occupation) | Stratification | Statistic | Exposure Index | | | Contrast | Adj. Relative Risk (95% C.I.) | p-Value |
|--------------|------------------------------------|----------------|-----------|----------------|--------|------|----------|----------------------------------|----------------------|
| | | | | Low | Medium | High | | | |
| Depression | Exposure Index-by- Race | Nonblack | n | 138 | 149 | 128 | Overall | | 0.856* |
| | | | Number/% | | | | | | |
| | | | Abnormal | 21 | 15.2% | 20 | 15.6% | M vs. L | 0.86 (0.45, 1.67)* |
| | Race (Enlisted Groundcrew) | Black | Normal | 117 | 84.8% | 129 | 86.6% | H vs. L | 1.03 (0.53, 2.01)* |
| | | | n | 16 | 14 | 13 | Overall | | 0.092* |
| | | | Number/% | | | | | | |
| Hypochondria | Exposure Index-by- Education | High School | Abnormal | 4 | 25.0% | 1 | 7.1% | M vs. L | 0.23 (0.02, 2.37)* |
| | | | Normal | 12 | 75.0% | 13 | 92.9% | H vs. L | 0.10 (0.01, 2.11)** |
| | Education (Officer) | College | n | 11 | 17 | 24 | Overall | | 0.011* |
| | | | Number/% | | | | | | |
| | | | Abnormal | 4 | 36.4% | 3 | 17.7% | M vs. L | 0.38 (0.07, 2.16)* |
| | | | Normal | 7 | 63.6% | 14 | 82.3% | H vs. L | 0.03 (0.002, 0.71)** |
| Hypochondria | Exposure Index-by- Race | Nonblack | n | 116 | 113 | 99 | Overall | | 0.120* |
| | | | Number/% | | | | | | |
| | | | Abnormal | 6 | 5.2% | 3 | 2.7% | M vs. L | 0.50 (0.12, 2.05)* |
| | Race (Enlisted Groundcrew) | Black | Normal | 110 | 94.8% | 110 | 97.3% | H vs. L | 1.83 (0.63, 5.34)* |
| | | | n | 134 | 146 | 119 | | | |
| | | | Number/% | | | | | | |
| Hypochondria | Exposure Index-by- Education | High School | Abnormal | 17 | 12.7% | 15 | 10.3% | M vs. L | 0.82 (0.39, 1.74) |
| | | | Normal | 117 | 87.3% | 131 | 89.7% | H vs. L | 1.67 (0.83, 3.33) |
| | Education (Officer) | College | n | 14 | 14 | 12 | | | |
| | | | Number/% | | | | | | |
| | | | Abnormal | 6 | 42.9% | 3 | 21.4% | M vs. L | 0.31 (0.06, 1.70) |
| | | | Normal | 8 | 57.1% | 11 | 78.6% | H vs. L | 0.10 (0.01, 1.02) |

TABLE J-7. (continued)

Interaction Summaries of Adjusted Exposure Index Analyses for Psychological Variables

| Variable | Interaction (Occupation) | Stratification | Statistic | Exposure Index | | | Contrast | Adj. Relative Risk (95% C.I.) | p-Value |
|---------------------|---|----------------|-----------|----------------|--------|------|----------|----------------------------------|----------------------|
| | | | | Low | Medium | High | | | |
| Hysteria | Exposure Index-by- Education (Officer) | High School | n | 11 | 17 | 24 | Overall | | 0.129* |
| | | | Number/% | | | | | | |
| | | | Abnormal | 2 | 18.2% | 2 | 11.8% | 0 | 0.0% |
| | | College(b) | Normal | 9 | 81.8% | 15 | 88.2% | 24 | 100.0% |
| | | | | | | | | H vs. L | 0.60 (0.07, 5.03)* |
| | | | | | | | | H vs. L | 0.08 (0.003, 1.77)** |
| Hysteria | Exposure Index-by- Race (Enlisted Groundcrew) | Nonblack | n | 138 | 149 | 128 | Overall | | 0.029* |
| | | | Number/% | | | | | | |
| | | | Abnormal | 23 | 16.7% | 13 | 8.7% | 25 | 19.5% |
| | | Black | Normal | 115 | 83.3% | 136 | 91.3% | 103 | 80.5% |
| | | | | | | | | H vs. L | 0.48 (0.23, 0.99)* |
| | | | | | | | | H vs. L | 1.21 (0.65, 2.27)* |
| Mania/ Hypomania | Exposure Index-by- Drink-years (Officer) | 0 | n | 16 | 14 | 13 | Overall | | 0.094* |
| | | | Number/% | | | | | | |
| | | | Abnormal | 5 | 31.2% | 3 | 21.4% | 0 | 0.0% |
| | | 0-50 | Normal | 11 | 68.8% | 11 | 78.6% | 13 | 100.0% |
| | | | | | | | | H vs. L | 0.60 (0.11, 3.15)* |
| | | | | | | | | H vs. L | 0.08 (0.004, 1.56)** |
| Mania/ Hypomania | Exposure Index-by- Drink-years (Officer) | >50 | n | 5 | 0 | 6 | Overall | | 0.207* |
| | | | Number/% | | | | | | |
| | | | Abnormal | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| | | 0-50 | Normal | 5 | 100.0% | 6 | 100.0% | 6 | 100.0% |
| | | | | | | | | H vs. L | 0.58 (0.18, 1.84)* |
| | | | | | | | | H vs. L | 0.27 (0.06, 1.30)* |
| Mania/ Hypomania | Exposure Index-by- Drink-years (Officer) | 0 | n | 105 | 109 | 92 | Overall | | 0.016* |
| | | | Number/% | | | | | | |
| | | | Abnormal | 8 | 7.6% | 5 | 4.6% | 2 | 2.2% |
| | | >50 | Normal | 97 | 92.4% | 104 | 95.4% | 90 | 97.8% |
| | | | | | | | | H vs. L | 0.58 (0.18, 1.84)* |
| | | | | | | | | H vs. L | 0.27 (0.06, 1.30)* |
| Mania/ Hypomania | Exposure Index-by- Drink-years (Officer) | 0 | n | 15 | 18 | 22 | Overall | | 0.016* |
| | | | Number/% | | | | | | |
| | | | Abnormal | 0 | 0.0% | 0 | 0.0% | 5 | 22.7% |
| | | >50 | Normal | 15 | 100.0% | 18 | 100.0% | 17 | 77.3% |
| | | | | | | | | H vs. L | 9.74 (0.50, 190.8)** |
| | | | | | | | | H vs. L | 0.067* |

TABLE J-7. (continued)

Interaction Summaries of Adjusted Exposure Index Analyses for Psychological Variables

| Variable | Interaction (Occupation) | Stratification | Statistic | Exposure Index | | | Contrast | Adj. Relative Risk (95% C.I.) | p-Value |
|----------------------------|---|----------------|----------------------|----------------|--------|--------|-------------------|----------------------------------|---------|
| | | | | Low | Medium | High | | | |
| Masculinity/ Femininity | Exposure Index-by- Education (Officer) | High School | n | 11 | 16 | 24 | | | |
| | | | Number/% Abnormal | 1 | 4 | 1 | 4.2% M vs. L | 5.96 (0.53,67.59) | 0.150 |
| | | College | Normal | 10 | 12 | 23 | 95.8% H vs. L | 0.33 (0.02,6.55) | 0.467 |
| | | | n | 114 | 110 | 96 | | | |
| Paranoia | Exposure Index-by- Age (Officer) | Born >=1942 | Number/% Abnormal | 0 | 1 | 4.5% | 0.0% M vs. L | 6.07 (0.24,155.30)** | 0.338* |
| | | | Normal | 43 | 21 | 95.5% | 11 100.0% H vs. L | — | — |
| | | Born <1942 | n | 84 | 108 | 112 | Overall | | 0.106* |
| | | | Number/% Abnormal | 1 | 0 | 0.0% | 3.6% M vs. L | 0.26 (0.01,6.38)** | 0.437* |
| Paranoia | Exposure Index-by- Age (Enlisted Flyer) | Born >=1942 | Normal | 83 | 108 | 108 | 96.4% H vs. L | 3.07 (0.34,28.02)* | 0.394* |
| | | | n | 11 | 18 | 9 | Overall | | 0.565* |
| | | Born <1942 | Number/% Abnormal | 0 | 1 | 5.6% | 0.0% M vs. L | 1.97 (0.07,52.71)** | 0.999* |
| | | | Normal | 11 | 17 | 94.4% | 9 100.0% H vs. L | — | — |
| Paranoia | Exposure Index-by- Age (Enlisted Flyer) | Born >=1942 | n | 43 | 47 | 48 | Overall | | 0.195* |
| | | | Number/% Abnormal | 3 | 0 | 0.0% | 3 6.3% M vs. L | 0.12 (0.01,2.43)** | 0.105* |
| | | Born <1942 | Normal | 40 | 47 | 100.0% | 45 93.7% H vs. L | 0.89 (0.17,4.66)* | 0.999* |
| | | | n | 43 | 47 | 48 | Overall | | 0.195* |

TABLE J-7. (continued)
Interaction Summaries of Adjusted Exposure Index Analyses for Psychological Variables

| Variable | Interaction (Occupation) | Stratification | Statistic | Exposure Index | | | Contrast | Adj. Relative Risk (95% C.I.) | p-Value |
|--------------------------|------------------------------------|----------------|----------------------|----------------|--------|------|----------------|----------------------------------|---------|
| | | | | Low | Medium | High | | | |
| Paranoia | Exposure Index-by- Race | Nonblack | n | 138 | 149 | 128 | Overall | | 0.348* |
| | | | Number/% Abnormal | 3 | 2.2% | 7 | 5.5% M vs. L | 1.56 (0.37,6.66)* | 0.724 |
| | | Black | Normal | 135 | 97.8% | 121 | 94.5% H vs. L | 2.60 (0.66,10.30)* | 0.204* |
| | | | n | 16 | 14 | 13 | Overall | | 0.422* |
| | (Enlisted Groundcrew) | Black | Number/% Abnormal | 2 | 12.5% | 1 | 0.0% M vs. L | 0.54 (0.04,6.67)* | 0.999* |
| | | | Normal | 14 | 87.5% | 13 | 100.0% H vs. L | 0.22 (0.01,4.89)** | 0.488* |
| Psychopathic/ Deviate | Exposure Index-by- Education | High School | n | 110 | 131 | 108 | Overall | | |
| | | | Number/% Abnormal | 16 | 14.5% | 24 | 22.2% M vs. L | 0.75 (0.35,1.64) | 0.475 |
| | | College | Normal | 94 | 85.5% | 84 | 77.8% H vs. L | 1.50 (0.72,3.09) | 0.278 |
| | | | n | 38 | 29 | 23 | Overall | | |
| | (Enlisted Groundcrew) | College | Number/% Abnormal | 8 | 21.1% | 3 | 4.3% M vs. L | 0.52 (0.12,2.23) | 0.377 |
| | | | Normal | 30 | 78.9% | 26 | 95.7% H vs. L | 0.12 (0.01,1.11) | 0.062 |

TABLE J-7. (continued)

Interaction Summaries of Adjusted Exposure Index Analyses for Psychological Variables

| Variable | Interaction (Occupation) | Stratification | Statistic | Exposure Index | | | Contrast | Adj. Relative Risk (95% C.I.) | p-Value |
|-----------|-----------------------------|----------------|-----------------------|------------------------|-----------------------|-----------------------|----------|----------------------------------|---------|
| | | | | Low | Medium | High | | | |
| Total OMI | 0 | n | Adj. Mean 95% C.I. | 5 | 0 | 6 | M vs. L | (c) | — |
| | | | | 4.01 (1.77, 8.06) | — | 6.87 (3.57, 12.53) | M vs. L | (c) | 0.228 |
| | 0-50 | n | Adj. Mean 95% C.I. | 104 | 107 | 92 | M vs. L | (c) | 0.964 |
| | | | | 6.95 (5.10, 9.37) | 6.98 (5.13, 9.39) | 8.40 (6.19, 11.29) | H vs. L | (c) | 0.058 |
| | >50 | n | Adj. Mean 95% C.I. | 15 | 17 | 22 | M vs. L | (c) | 0.007 |
| | | | | 13.74 (8.91, 20.92) | 7.17 (4.68, 10.75) | 9.27 (6.34, 13.36) | H vs. L | (c) | 0.080 |
| | | n | Adj. Mean 95% C.I. | 104 | 107 | 92 | M vs. L | (c) | 0.964 |
| | | | | 6.95 (5.10, 9.37) | 6.98 (5.13, 9.39) | 8.40 (6.19, 11.29) | H vs. L | (c) | 0.058 |
| | | n | Adj. Mean 95% C.I. | 15 | 17 | 22 | M vs. L | (c) | 0.007 |
| | | | | 13.74 (8.91, 20.92) | 7.17 (4.68, 10.75) | 9.27 (6.34, 13.36) | H vs. L | (c) | 0.080 |

TABLE J-7. (continued)
Interaction Summaries of Adjusted Exposure Index Analyses for Psychological Variables

| Variable | Interaction (Occupation) | Stratification | Statistic | Exposure Index | | | Contrast | Adj. Relative Risk (95% C.I.) | p-Value |
|-----------|---|---------------------|-----------------------|-------------------------|-------------------------|-------------------------|----------|----------------------------------|---------|
| | | | | Low | Medium | High | | | |
| Total OMI | Exposure Index-by- Education | High School 0 | n | 2 | 4 | 4 | M vs. L | (c) | 0.018 |
| | | | Adj. Mean 95% C.I. | 4.00 (1.01, 11.48) | 17.79 (8.68, 35.49) | 11.32 (5.31, 23.09) | M vs. L | (c) | 0.106 |
| | | High School 0-50 | n | 25 | 36 | 27 | M vs. L | (c) | 0.191 |
| | | | Adj. Mean 95% C.I. | 16.06 (11.23, 22.81) | 12.68 (9.27, 17.23) | 10.87 (7.82, 14.97) | M vs. L | (c) | 0.045 |
| | | High School >50 | n | 14 | 10 | 11 | M vs. L | (c) | 0.509 |
| | | | Adj. Mean 95% C.I. | 16.32 (10.59, 24.87) | 19.64 (12.38, 30.85) | 18.27 (11.68, 28.27) | M vs. L | (c) | 0.680 |
| | Exposure Index-by- Drink-Years (Enlisted Flyer) | College 0 | n | 1 | 1 | 0 | M vs. L | (c) | 0.049 |
| | | | Adj. Mean 95% C.I. | 0.84 (0, 5.66) | 10.17 (2.13, 38.86) | — — | M vs. L | (c) | — |
| | | College 0-50 | n | 6 | 10 | 8 | M vs. L | (c) | 0.100 |
| | | | Adj. Mean 95% C.I. | 6.43 (3.25, 11.97) | 11.84 (7.33, 18.81) | 11.92 (7.06, 19.72) | M vs. L | (c) | 0.112 |
| | | College >50 | n | 0 | 0 | 1 | M vs. L | (c) | — |
| | | | Adj. Mean 95% C.I. | — — | — — | 20.55 (5.04, 75.84) | M vs. L | (c) | — |

TABLE J-7. (continued)

Interaction Summaries of Adjusted Exposure Index Analyses for Psychological Variables

| Variable | Interaction (Occupation) | Stratification | Statistic | Exposure Index | | | Contrast | Adj. Relative Risk (95% C.I.) | p-Value |
|--------------|--|----------------|-----------|----------------|--------|------|---------------|----------------------------------|---------|
| | | | | Low | Medium | High | | | |
| M-R Subscore | 0 | n Number/% | | 3 | 5 | 4 | Overall | | 0.060* |
| | | | >0 | 0 | 0.0% | 3 | 75.0% M vs. L | 21.00 (0.64, 690.0)** | 0.143* |
| | | | 0 | 3 | 100.0% | 1 | 25.0% H vs. L | 16.33 (0.48, 555.6)** | 0.143* |
| | Exposure Index-by- Drink-years (Enlisted Flyer | n Number/% | | 31 | 46 | 35 | Overall | | 0.054 |
| | | | >0 | 12 | 38.7% | 10 | 28.6% M vs. L | 1.98 (0.77, 5.09) | 0.158 |
| | | | 0 | 19 | 61.3% | 25 | 71.4% H vs. L | 0.65 (0.23, 1.83) | 0.410 |
| | 0-50(a) | n Number/% | | 14 | 10 | 12 | Overall | | 0.440 |
| | | | >0 | 7 | 50.0% | 5 | 50.0% M vs. L | 1.00 (0.20, 5.07) | 1.000 |
| | | | 0 | 7 | 50.0% | 3 | 25.0% H vs. L | 2.67 (0.49, 14.46) | 0.255 |
| | >50(a) | n Number/% | | 14 | 10 | 12 | Overall | | 0.440 |
| | | | >0 | 7 | 50.0% | 5 | 50.0% M vs. L | 1.00 (0.20, 5.07) | 1.000 |
| | | | 0 | 7 | 50.0% | 3 | 25.0% H vs. L | 2.67 (0.49, 14.46) | 0.255 |

TABLE J-7. (continued)
Interaction Summaries of Adjusted Exposure Index Analyses for Psychological Variables

| Variable | Interaction (Occupation) | Stratification | Statistic | Exposure Index | | | Contrast | Adj. Relative Risk (95% C.I.) | p-Value |
|----------------------|---|-------------------------------------|----------------------|----------------|--------|------|----------|----------------------------------|---------|
| | | | | Low | Medium | High | | | |
| A-H Area Subscore | Exposure Index-by- Education | High School 0 Drink-years | n | 2 | 4 | 4 | Overall | | 0.007* |
| | | | Number/% Abnormal | 0 | 4 | 4 | M vs. L | 45.00 (0.67, 304.3)** | 0.067* |
| | | High School 0-50 Drink- years | Normal | 2 | 0 | 0 | H vs. L | 45.00 (0.67, 304.3)** | 0.067* |
| | | | n | 22 | 33 | 22 | Overall | | 0.035* |
| | | High School >50 Drink- years | Number/% Abnormal | 18 | 18 | 10 | M vs. L | 0.27 (0.07, 0.96)* | 0.047* |
| | | | Normal | 4 | 15 | 12 | Y vs. L | 0.19 (0.05, 0.73)* | 0.027* |
| | Index-by- Drink-years (Enlisted Flyer) | High School >50 Drink- years | n | 14 | 9 | 11 | Overall | | 0.583* |
| | | | Number/% Abnormal | 10 | 8 | 9 | M vs. L | 3.20 (0.30, 34.59)* | 0.611* |
| | | Exposure 0 Drink-years | Normal | 4 | 1 | 2 | H vs. L | 1.80 (0.26, 12.30)* | 0.661* |
| | | | n | n | 1 | 1 | Overall | | — |
| | | College 0-50 Drink- years | College Abnormal | 0 | 0 | 0 | M vs. L | — | — |
| | | | Normal | 0 | 1 | 1 | H vs. L | — | — |
| | College >50 Drink- years | College 0-50 Drink- years | n | 6 | 10 | 7 | Overall | | 0.115* |
| | | | Number/% Abnormal | 1 | 6 | 5 | M vs. L | 7.50 (0.62, 90.65)* | 0.145* |
| | | College >50 Drink- years | Normal | 5 | 4 | 2 | H vs. L | 12.50 (0.84, 186.30)* | 0.103* |
| | | | n | 0 | 0 | 1 | Overall | | — |
| | | College >50 Drink- years | Number/% Abnormal | 0 | 0 | 1 | M vs. L | — | — |
| | | | Normal | 0 | 0 | 0 | H vs. L | — | — |

TABLE J-7. (continued)

| Variable | Interaction (Occupation) | Stratification | Statistic | Exposure Index | | | Contrast | Adj. Relative Risk (95% C.I.) | p-Value | | | |
|-------------------------|-----------------------------|----------------|-----------|----------------|--------|------|----------|----------------------------------|---------|---------|------------------|-------|
| | | | | Low | Medium | High | | | | | | |
| HRB Impairment Index | Nonblack | n | | 132 | 144 | 115 | | | | | | |
| | | Number/% | | | | | | | | | | |
| | | Abnormal | | 48 | 36.4% | 59 | 41.0% | 40 | 34.8% | M vs. L | 1.88 (1.09,3.25) | 0.024 |
| | | Normal | | 84 | 63.6% | 85 | 59.0% | 75 | 65.2% | H vs. L | 0.77 (0.43,1.40) | 0.400 |
| | Black | n | | 13 | 14 | 12 | | | | | | |
| | | Number/% | | | | | | | | | | |
| | | Abnormal | | 11 | 84.6% | 10 | 71.4% | 3 | 25.0% | M vs. L | 0.39 (0.05,2.72) | 0.340 |
| | | Normal | | 2 | 15.4% | 4 | 28.6% | 9 | 75.0% | H vs. L | 0.06 (0.01,0.44) | 0.006 |

*Unadjusted estimate of relative risk and confidence interval, or p-value, based on stratified tables.

##Unadjusted estimate of relative risk and confidence interval calculated after adding 0.5 to each cell.

(a) Results have been adjusted for education.

(b) Results have been adjusted for age.

—Zero counts in cells do not allow for calculation of percent, relative risk, confidence interval, or p-value.

(c) No relative risk given for total CMI, which was analyzed continuously.

Note: Small sample sizes may affect validity of overall p-value.

Note: Results without (*) or (**) are adjusted for all other main effects in model (age, race, education, drink-years, and combat index [for MPI variables]), unless otherwise noted.

Note: Participants judged to have PTSD are eliminated from analysis of Total QMI, Section M-R Subscore, Section A-H Area Subscore, and HRB Impairment Index.

TABLE J-8.

Unadjusted Analyses for Reported Psychological Illnesses by Group:
Baseline and First Followup Studies Combined*
(Original Comparisons Only)

| Type of Illness | Group Abnormalities | | | | Total | p-Value** |
|--------------------|---------------------|---------|---------------------|---------|-------|-----------|
| | Ranch Hand | | Original Comparison | | | |
| | Number | Percent | Number | Percent | | |
| Psychoses | 14 | 1.4 | 8 | 0.8 | 22 | 0.289 |
| Alcohol Dependence | 9 | 0.9 | 4 | 0.4 | 13 | 0.268 |
| Anxiety | 7 | 0.7 | 8 | 0.8 | 15 | 0.798 |
| Other Neuroses | 72 | 7.1 | 46 | 4.8 | 118 | 0.037 |

*Analyses based on 1,016 Ranch Hands and 955 Original Comparisons; some participants had more than one illness.

**Fisher's exact test.

TABLE J-9.

**Summary of Kolmogorov-Smirnov Tests on MMPI for Officers
(Original Comparisons Only)**

| Parameter* | Group | Mean Score | Standard Deviation | Kolmogorov- Smirnov p-Value |
|----------------------------|---------------------|---------------|-----------------------|-----------------------------------|
| Anxiety | Ranch Hand | 52.82 | 7.38 | 0.328 |
| | Original Comparison | 53.22 | 7.06 | |
| Consistency | Ranch Hand | 49.23 | 6.92 | 0.995 |
| | Original Comparison | 49.02 | 5.50 | |
| Defensiveness | Ranch Hand | 49.64 | 6.64 | 0.822 |
| | Original Comparison | 49.69 | 7.14 | |
| Denial | Ranch Hand | 59.47 | 7.31 | 0.901 |
| | Original Comparison | 59.46 | 7.40 | |
| Depression | Ranch Hand | 55.11 | 10.17 | 0.975 |
| | Original Comparison | 54.86 | 9.38 | |
| Hypochondria | Ranch Hand | 55.60 | 8.85 | 0.990 |
| | Original Comparison | 54.96 | 8.09 | |
| Hysteria | Ranch Hand | 60.45 | 7.00 | 0.711 |
| | Original Comparison | 59.79 | 6.81 | |
| Mania/Hypomania | Ranch Hand | 54.36 | 8.94 | 0.436 |
| | Original Comparison | 53.68 | 9.10 | |
| Masculinity/ Femininity | Ranch Hand | 58.83 | 8.64 | 0.577 |
| | Original Comparison | 58.14 | 8.94 | |
| Paranoia | Ranch Hand | 53.71 | 7.34 | 0.995 |
| | Original Comparison | 53.57 | 6.86 | |
| Psychopathic/ Deviate | Ranch Hand | 56.82 | 8.87 | 0.644 |
| | Original Comparison | 56.61 | 9.65 | |
| Schizophrenia | Ranch Hand | 54.80 | 8.48 | 0.661 |
| | Original Comparison | 54.66 | 7.89 | |
| Social Introversion | Ranch Hand | 46.56 | 7.43 | 0.627 |
| | Original Comparison | 47.13 | 7.60 | |
| Validity | Ranch Hand | 0.93 | 3.11 | 0.594 |
| | Original Comparison | 0.80 | 2.86 | |

*n=380 Ranch Hands; n=350 Original Comparisons.

TABLE J-10.

**Summary of Kolmogorov-Smirnov Tests on MMPI for Enlisted Flyers
(Original Comparisons Only)**

| Parameter* | Group | Mean Score | Standard Deviation | Kolmogorov- Smirnov p-Value |
|----------------------------|---------------------|---------------|-----------------------|-----------------------------------|
| Anxiety | Ranch Hand | 54.78 | 9.73 | 0.993 |
| | Original Comparison | 54.16 | 8.78 | |
| Consistency | Ranch Hand | 52.24 | 10.30 | 0.923 |
| | Original Comparison | 51.41 | 8.15 | |
| Defensiveness | Ranch Hand | 53.05 | 7.96 | 0.353 |
| | Original Comparison | 52.09 | 8.34 | |
| Denial | Ranch Hand | 55.95 | 8.73 | 0.760 |
| | Original Comparison | 56.81 | 8.44 | |
| Depression | Ranch Hand | 58.21 | 11.79 | 0.760 |
| | Original Comparison | 57.27 | 10.35 | |
| Hypochondria | Ranch Hand | 58.48 | 12.16 | 0.577 |
| | Original Comparison | 58.44 | 11.71 | |
| Hysteria | Ranch Hand | 60.00 | 8.94 | 0.465 |
| | Original Comparison | 60.70 | 8.77 | |
| Mania/Hypomania | Ranch Hand | 55.05 | 10.00 | 0.155 |
| | Original Comparison | 55.50 | 9.42 | |
| Masculinity/ Femininity | Ranch Hand | 55.79 | 7.85 | 0.877 |
| | Original Comparison | 56.22 | 8.39 | |
| Paranoia | Ranch Hand | 52.77 | 8.43 | 0.877 |
| | Original Comparison | 51.72 | 7.68 | |
| Psychopathic/ Deviate | Ranch Hand | 57.48 | 11.40 | 0.163 |
| | Original Comparison | 57.85 | 9.72 | |
| Schizophrenia | Ranch Hand | 56.56 | 13.03 | 0.496 |
| | Original Comparison | 56.27 | 10.59 | |
| Social Introversion | Ranch Hand | 50.35 | 8.89 | 0.194 |
| | Original Comparison | 49.00 | 7.94 | |
| Validity | Ranch Hand | 3.93 | 42.48 | 0.864 |
| | Original Comparison | 7.18 | 60.31 | |

*n=176 Ranch Hands; n=172 Original Comparisons (except for validity, where n=177 Ranch Hands and n=174 Original Comparisons).

TABLE J-11.

Summary of Kolmogorov-Smirnov Tests on MMPI
for Enlisted Groundcrew
(Original Comparisons Only)

| Parameter* | Group | Mean Score | Standard Deviation | Kolmogorov- Smirnov p-Value |
|----------------------------|---------------------|---------------|-----------------------|-----------------------------------|
| Anxiety | Ranch Hand | 55.86 | 10.96 | 0.877 |
| | Original Comparison | 55.72 | 9.34 | |
| Consistency | Ranch Hand | 53.05 | 10.64 | 0.728 |
| | Original Comparison | 51.78 | 8.19 | |
| Defensiveness | Ranch Hand | 52.42 | 8.27 | 0.923 |
| | Original Comparison | 52.69 | 8.51 | |
| Denial | Ranch Hand | 55.53 | 8.57 | 0.112 |
| | Original Comparison | 56.80 | 8.72 | |
| Depression | Ranch Hand | 58.79 | 12.98 | 0.661 |
| | Original Comparison | 57.85 | 10.63 | |
| Hypochondria | Ranch Hand | 58.44 | 13.22 | 0.577 |
| | Original Comparison | 57.50 | 11.30 | |
| Hysteria | Ranch Hand | 60.36 | 9.80 | 0.644 |
| | Original Comparison | 59.75 | 8.84 | |
| Mania/Hypomania | Ranch Hand | 55.26 | 9.78 | 0.822 |
| | Original Comparison | 55.69 | 9.72 | |
| Masculinity/ Femininity | Ranch Hand | 56.18 | 8.24 | 0.304 |
| | Original Comparison | 57.24 | 8.49 | |
| Paranoia | Ranch Hand | 53.12 | 9.05 | 0.340 |
| | Original Comparison | 53.73 | 8.48 | |
| Psychopathic/ Deviate | Ranch Hand | 59.01 | 11.29 | 0.644 |
| | Original Comparison | 59.34 | 10.70 | |
| Schizophrenia | Ranch Hand | 58.20 | 14.22 | 0.328 |
| | Original Comparison | 57.58 | 10.64 | |
| Social Introversion | Ranch Hand | 51.86 | 9.82 | 0.353 |
| | Original Comparison | 50.99 | 8.63 | |
| Validity | Ranch Hand | 1.97 | 26.48 | 0.999 |
| | Original Comparison | 0.97 | 5.41 | |

*n=458 Ranch Hands; n=430 Original Comparisons (except for validity, where n=459 Ranch Hands and n=431 Original Comparisons).

TABLE J-12.

Summary of Kolmogorov-Smirnov Tests on CMI
(Original Comparisons Only)

| Stratification | Group | Sample Size | Mean Score | Standard Deviation | Kolmogorov-Smirnov p-Value |
|----------------------------|---------------------|-------------|------------|--------------------|----------------------------|
| <u>Age</u> | | | | | |
| Born ≥ 1942 | Ranch Hand | 402 | 15.88 | 15.21 | <0.001 |
| | Original Comparison | 366 | 12.95 | 11.57 | |
| Born 1923-1941 | Ranch Hand | 562 | 15.49 | 12.99 | 0.776 |
| | Original Comparison | 528 | 14.55 | 11.88 | |
| Born ≤ 1922 | Ranch Hand | 36 | 18.56 | 15.94 | 0.980 |
| | Original Comparison | 45 | 16.47 | 9.28 | |
| <u>Race</u> | | | | | |
| Nonblack | Ranch Hand | 941 | 15.63 | 13.83 | 0.038 |
| | Original Comparison | 882 | 13.96 | 11.47 | |
| Black | Ranch Hand | 59 | 17.81 | 16.91 | 0.561 |
| | Original Comparison | 57 | 14.82 | 14.62 | |
| <u>Education</u> | | | | | |
| High School | Ranch Hand | 556 | 18.88 | 15.80 | <0.001 |
| | Original Comparison | 524 | 15.62 | 13.12 | |
| College | Ranch Hand | 444 | 11.85 | 10.18 | 0.577 |
| | Original Comparison | 415 | 11.99 | 9.16 | |
| <u>Current Alcohol Use</u> | | | | | |
| Drinker | Ranch Hand | 851 | 15.16 | 13.12 | 0.170 |
| | Original Comparison | 812 | 13.77 | 11.32 | |
| Nondrinker | Ranch Hand | 148 | 18.84 | 17.71 | 0.162 |
| | Original Comparison | 127 | 15.61 | 13.69 | |
| <u>Occupation</u> | | | | | |
| Officer | Ranch Hand | 377 | 11.23 | 9.01 | 0.970 |
| | Original Comparison | 345 | 10.99 | 7.53 | |
| Enlisted Flyer | Ranch Hand | 174 | 17.72 | 14.84 | 0.270 |
| | Original Comparison | 170 | 15.31 | 12.51 | |
| Enlisted Groundcrew | Ranch Hand | 449 | 18.80 | 16.06 | 0.003 |
| | Original Comparison | 424 | 15.96 | 13.48 | |

TABLE J-13.

Unadjusted Analyses for MMPI by Group
(Original Comparisons Only)

| Variable | Statistic | Group | | | | Est. Relative Risk (95% C.I.) | p-Value |
|---------------|-----------|------------|---------|---------------------|---------|-------------------------------|---------|
| | | Ranch Hand | | Original Comparison | | | |
| | | Number | Percent | Number | Percent | | |
| Anxiety | n | 1,014 | | 952 | | | |
| | Abnormal | 73 | 7.2 | 49 | 5.1 | 1.43 (0.98, 2.08) | 0.062 |
| | Normal | 941 | 92.8 | 903 | 94.9 | | |
| Consistency | n | 1,014 | | 952 | | | |
| | Abnormal | 36 | 3.6 | 22 | 2.3 | 1.56 (0.91, 2.67) | 0.111 |
| | Normal | 978 | 96.4 | 930 | 97.7 | | |
| Defensiveness | n | 1,014 | | 952 | | | |
| | Abnormal | 23 | 2.3 | 30 | 3.2 | 0.71 (0.41, 1.24) | 0.265 |
| | Normal | 991 | 97.7 | 922 | 96.8 | | |
| Denial | n | 1,014 | | 952 | | | |
| | Abnormal | 17 | 1.7 | 37 | 3.9 | 0.42 (0.24, 0.75) | 0.003 |
| | Normal | 997 | 98.3 | 915 | 96.1 | | |
| Depression | n | 1,014 | | 952 | | | |
| | Abnormal | 114 | 11.2 | 87 | 9.1 | 1.26 (0.94, 1.69) | 0.136 |
| | Normal | 900 | 88.8 | 865 | 90.9 | | |
| Hypochondria | n | 1,014 | | 952 | | | |
| | Abnormal | 119 | 11.7 | 91 | 9.6 | 1.26 (0.94, 1.68) | 0.125 |
| | Normal | 895 | 88.3 | 861 | 90.4 | | |
| Hysteria | n | 1,014 | | 952 | | | |
| | Abnormal | 123 | 12.1 | 89 | 9.4 | 1.34 (1.00, 1.79) | 0.050 |
| | Normal | 891 | 87.9 | 863 | 90.6 | | |

TABLE J-13. (continued)
Unadjusted Analyses for MMPI by Group
(Original Comparisons Only)

| Variable | Statistic | Group | | | | Est. Relative Risk (95% C.I.) | p-Value |
|----------------------------|-----------|------------|---------|---------------------|---------|-------------------------------|---------|
| | | Ranch Hand | | Original Comparison | | | |
| | | Number | Percent | Number | Percent | | |
| Mania/Hypomania | n | 1,014 | | 952 | | | |
| | Abnormal | 63 | 6.2 | 56 | 5.9 | 1.06 (0.73,1.54) | 0.777 |
| | Normal | 951 | 93.8 | 896 | 94.1 | | |
| Masculinity/ Femininity | n | 1,014 | | 952 | | | |
| | Abnormal | 66 | 6.5 | 83 | 8.7 | 0.73 (0.52,1.02) | 0.073 |
| | Normal | 948 | 93.5 | 869 | 91.3 | | |
| Paranoia | n | 1,014 | | 952 | | | |
| | Abnormal | 31 | 3.1 | 17 | 1.8 | 1.73 (0.95,3.16) | 0.079 |
| | Normal | 983 | 96.9 | 935 | 98.2 | | |
| Psychopathic/ Deviate | n | 1,014 | | 952 | | | |
| | Abnormal | 120 | 11.8 | 104 | 10.9 | 1.09 (0.83,1.45) | 0.570 |
| | Normal | 894 | 88.2 | 848 | 89.1 | | |
| Schizophrenia | n | 1,014 | | 952 | | | |
| | Abnormal | 94 | 9.3 | 71 | 7.5 | 1.27 (0.92,1.75) | 0.166 |
| | Normal | 920 | 90.7 | 881 | 92.5 | | |
| Social Introversion | n | 1,014 | | 952 | | | |
| | Abnormal | 26 | 2.6 | 14 | 1.5 | 1.76 (0.92,3.40) | 0.109 |
| | Normal | 988 | 97.4 | 938 | 98.5 | | |
| Validity | n | 1,016 | | 955 | | | |
| | >0 | 224 | 22.0 | 198 | 20.7 | 1.08 (0.87,1.34) | 0.510 |
| | 0 | 792 | 78.0 | 757 | 79.3 | | |

TABLE J-14.

Adjusted Analyses for MMPI by Group
(Original Comparisons Only)

| Variable | Group | | Adj. Relative Risk (95% C.I.) | p-Value | Covariate Remarks* |
|-----------------|---------------------|---------------------------------|----------------------------------|---------|---|
| | Ranch Hand Total | Original Comparison Total | | | |
| Anxiety | 1,012 | 950 | 1.39 (0.95, 2.05) | 0.092 | EDUC ($p < 0.001$) AGE*CI ($p = 0.010$) |
| Consistency | 976 | 926 | **** | **** | AGE ($p = 0.025$) RACE*DRKYR ($p = 0.024$) GRP*EDUC ($p = 0.034$) |
| Defensiveness | 976 | 926 | 0.68 (0.38, 1.19) | 0.175 | EDUC ($p < 0.001$) AGE*DRKYR ($p = 0.043$) |
| Denial | 974 | 924 | 0.43 (0.23, 0.80) | 0.006 | AGE*DRKYR ($p = 0.026$) EDUC*CI ($p = 0.040$) |
| Depression | 1,014 | 952 | 1.26 (0.94, 1.70) | 0.120 | EDUC ($p < 0.001$) |
| Hypochondria | 1,014 | 952 | 1.29 (0.96, 1.72) | 0.091 | AGE ($p = 0.005$) EDUC ($p < 0.001$) |
| Hysteria | 1,014 | 952 | 1.37 (1.02, 1.83) | 0.033 | AGE ($p = 0.001$) EDUC ($p < 0.001$) |
| Mania/Hypomania | 974 | 924 | 0.97 (0.66, 1.43) | 0.882 | AGE ($p = 0.048$) CI ($p = 0.010$) DRKYR ($p = 0.016$) |

TABLE J-14. (continued)
Adjusted Analyses for MMPI by Group
(Original Comparisons Only)

| Variable | Group | | Adj. Relative Risk (95% C.I.) | p-Value | Covariate Remarks* |
|----------------------------|------------------|---------------------------|-------------------------------|---------|--|
| | Ranch Hand Total | Original Comparison Total | | | |
| Masculinity/ Femininity | 1,014 | 952 | 0.71 (0.51, 1.00) | 0.047 | EDUC (p<0.001) RACE*AGE (p=0.006) |
| Paranoia | 1,012 | 950 | **** | **** | AGE*CI (p=0.004) GRP*AGE (p=0.040) |
| Psychopathic/ Deviate | 974 | 924 | 1.13 (0.84, 1.52) | 0.433 | EDUC (p=0.010) AGE*CI (p≥0.001) RACE*DRKYR (p=0.001) |
| Schizophrenia | 976 | 926 | 1.27 (0.91, 1.77) | 0.153 | EDUC (p<0.001) RACE*DRKYR (p=0.003) |
| Social Introversion | 1,014 | 952 | 1.72 (0.89, 3.31) | 0.099 | AGE (p=0.005) |
| Validity | 1,014 | 953 | **** | **** | AGE*CI (p=0.034) GRP*RACE (p=0.016) GRP*CI (p=0.030) |

*Abbreviations:

EDUC: education
CI: combat index
DRKYR: drink-years
GRP: group

***Group-by-covariate interaction: adjusted relative risk, confidence interval, and p-value are not presented.

TABLE J-15.

Unadjusted Analyses for the Cornell
Medical Index (CMI) by Group
(Original Comparisons Only)

| Variable | Statistic | Group | | Est. Relative Risk (95% C.I.) | p-Value |
|-------------------|---------------|----------------|------------------------|----------------------------------|---------|
| | | Ranch Hand | Original Comparison | | |
| Total CMI | n | 1,000 | 939 | | |
| | Mean* | 11.74 | 10.55 | -- | 0.004 |
| | 95% C.I.* | (11.17, 12.35) | (10.02, 11.11) | | |
| M-R Subscore | n | 998 | 936 | Overall | 0.198 |
| | Number/% | | | | |
| | 0 (Low) | 538 | 531 | Medium vs. Low | |
| | 1-10 (Medium) | 408 | 370 | 1.09 (0.91, 1.31) | 0.371 |
| | >10 (High) | 52 | 35 | High vs. Low | |
| | | | | 1.47 (0.99, 2.29) | 0.095 |
| A-H Area Subscore | n | 914 | 1,148 | Overall | 0.106 |
| | Number/% | | | | |
| | 0 (Low) | 360 | 375 | Medium vs. Low | |
| | 1-3 (Medium) | 449 | 394 | 1.19 (0.97, 1.45) | 0.090 |
| | 4-8 (High) | 105 | 82 | High vs. Low | |
| | | | | 1.33 (0.97, 1.84) | 0.086 |

*Transformed from log (X+1) scale, where X was the number of questions answered "yes."

--No relative risk given for Total CMI, which was analyzed as a continuous variable.

TABLE J-16.

Adjusted Analyses for CMI Variables by Group
(Original Comparisons Only)

| Variable | Statistic | Group | | Adj. Relative Risk (95% C.I.) | p-Value | Covariate Remarks* |
|----------------------|-----------|--------------|------------------------|----------------------------------|---------|--|
| | | Rank Hand | Original Comparison | | | |
| Total CMI | n | 962 | 913 | | | PTSD (p<0.001) |
| | Adj. Mean | **** | **** | -- | **** | RACE*DRKYR (p=0.027) |
| | 95% C.I. | **** | **** | | | AGE*EDUC (p=0.010) GRP*EDUC (p=0.002) |
| M-R Subscore | n | 998 | 935 | | | AGE (p<0.001) |
| | | | | **** | **** | PTSD (p<0.001) |
| | | | | | | GRP*EDUC (p=0.006) |
| A-H Area Subscore | n | 914 | 850 | | | AGE (p<0.001) |
| | | | | Overall | 0.108 | EDUC (p<0.001) |
| | | | | Medium vs. Low: | 0.063 | PTSD (p<0.001) |
| | | | | 1.20 (0.99,1.47) | 0.132 | |
| | | | | High vs. Low: | | |
| | | | | 1.32 (0.92,1.89) | | |

***Group-by-covariate interaction -- adjusted mean/relative risk, confidence interval, and p-value are not presented.

--No relative risk given for total CMI, which was analyzed as a continuous variable.

*Additional Abbreviations:

PTSD: post-traumatic stress disorder

TABLE J-17.

Summary Results for the Halstead-Reitan
Battery Impairment Index Unadjusted and Adjusted Analyses
(Original Comparisons Only)

| Analysis | Statistic | Group | | Ranch Hand | Original Comparison | | Est. Relative Risk (95% C.I). | p-Value | Covariate Remarks |
|---------------------|-----------|--------|---------|------------|---------------------|---------|-------------------------------|---------|---|
| | | Number | Percent | Number | Percent | Percent | | | |
| Unadjusted Analysis | n | 1,006 | | 947 | | | | | |
| | Abnormal | 348 | 34.6 | 319 | 33.7 | | 1.04 (0.86,1.26) | 0.703 | |
| | Normal | 658 | 65.4 | 628 | 66.3 | | | | |
| Adjusted Analysis | n | 1,006 | | 947 | | | 1.10 (0.90,1.34) | 0.359 | AGE (p<0.001) RACE (p<0.001) EDUC (p<0.001) |
| | | | | | | | | | |

TABLE J-18.

Summary of Group-by-Covariate Interactions
for Psychological Variables
(Original Comparisons Only)

| Variable | Interaction | Stratification | Statistic | Group | | Adj. Relative Risk (95% C.I.) | p-Value |
|-------------|------------------------|------------------|----------------------|------------|------------------------|----------------------------------|---------|
| | | | | Ranch Hand | Original Comparison | | |
| Consistency | Group-by- Education | High School | n | 537 | 516 | | |
| | | | Number/% Abnormal | 30 | 13 | 2.5% | 0.014 |
| | | College | Normal | 507 | 503 | 97.5% | |
| | | | n | 437 | 585 | | |
| Paranoia | Group-by- Age | Born \geq 1942 | Number/% Abnormal | 6 | 15 | 2.6% | 0.359 |
| | | | Normal | 431 | 570 | 97.4% | |
| | | Born <1942 | n | 410 | 545 | | |
| | | | Number/% Abnormal | 15 | 19 | 3.5% | 0.927 |
| | | Born <1942 | Normal | 395 | 526 | 96.5% | |
| | | | n | 602 | 740 | | |
| | | | Number/% Abnormal | 16 | 9 | 1.2% | 0.011 |
| | | | Normal | 586 | 731 | 98.8% | |

TABLE J-18. (continued)

Summary of Group-by-Covariate Interactions
for Psychological Variables
(Original Comparisons Only)

| Variable | Interaction | Stratification | Statistic | Group | | Adj. Relative Risk (95% C.I.) | p-Value |
|----------|-----------------------|-----------------------|-----------|------------|---------------------|-------------------------------|---------|
| | | | | Ranch Hand | Original Comparison | | |
| Validity | Group-by-Race | Nonblack CI=Low | n | 178 | 353 | | |
| | | | Number/% | | | | |
| | | | >0 | 47 | 73 | 20.7% | 0.059 |
| | | | 0 | 131 | 280 | 79.3% | |
| | | Nonblack CI=Medium | n | 367 | 295 | | |
| | | | Number/% | | | | |
| | | Nonblack CI=High | >0 | 78 | 43 | 14.6% | 0.021 |
| | | | 0 | 289 | 252 | 85.4% | |
| | | Nonblack CI=High | n | 409 | 247 | | |
| | | | Number/% | | | | |
| | | | >0 | 83 | 57 | 23.1% | 0.319 |
| | | | 0 | 326 | 190 | 76.9% | |
| | Group-by-Combat Index | Black CI=Low | n | 20 | 24 | | |
| | | | Number/% | | | | |
| | | | >0 | 6 | 9 | 37.5% | 0.170 |
| | | | 0 | 14 | 15 | 62.5% | |
| | | Black CI=Medium | n | 18 | 12 | | |
| | | | Number/% | | | | |
| | | Black CI=High | >0 | 6 | 5 | 41.7% | 0.239 |
| | | | 0 | 12 | 7 | 58.3% | |
| | | Black CI=High | n | 22 | 22 | | |
| | | | Number/% | | | | |
| | | | >0 | 3 | 11 | 50.0% | 0.006 |
| | | | 0 | 19 | 11 | 50.0% | |

TABLE J-18. (continued)

Summary of Group-by-Covariate Interactions
for Psychological Variables
(Original Comparisons Only)

| Variable | Interaction | Stratification | Statistic | Group | | Adj. Relative Risk (95% C.I.) | p-Value | | |
|--------------|--------------------|----------------|----------------------|---------------------|---------------------|-------------------------------|------------------|-------|-------|
| | | | | Ranch Hand | Original Comparison | | | | |
| Total OMI | Group-by-Education | High School | n | 529 | 511 | — | <0.001 | | |
| | | | Adj. Mean* 95% C.I.* | 35.50 (28.09,44.79) | 29.65 (23.27,37.70) | | | | |
| | | College | n | 433 | 402 | | | — | 0.498 |
| | | | Adj. Mean* 95% C.I.* | 22.70 (17.76,28.95) | 23.49 (18.37,29.97) | | | | |
| M-R Subscore | Group-by-Education | High School | n | 555 | 521 | Overall | 0.015 | | |
| | | | Number/% | | | Med vs. Low | | | |
| | | | 0 (Low) | 246 | 281 | 53.9% | 1.42 (1.11,1.82) | 0.005 | |
| | | | 1-10 (Med) | 267 | 213 | 40.9% | High vs. Low | | |
| | | | >10 (High) | 42 | 27 | 5.2% | 1.51 (0.84,2.70) | 0.167 | |
| | | | | | | | | | |
| | | College | n | 443 | 414 | Overall | 0.196 | | |
| | | | Number/% | | | Med vs. Low | | | |
| | | | 0 (Low) | 292 | 250 | 60.4% | 0.77 (0.58,1.02) | 0.071 | |
| | | | 1-10 (Med) | 141 | 156 | 37.7% | High vs. Low | | |
| | | | >10 (High) | 10 | 8 | 1.9% | 0.99 (0.34,2.87) | 0.991 | |
| | | | | | | | | | |

*Converted from log (X+1) scale, where X was the number of questions answered "yes".

—No relative risk given for Total OMI, which was analyzed as a continuous variable.

APPENDIX K
Gastrointestinal Assessment

APPENDIX K: Gastrointestinal Assessment

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APPENDIX K: Gastrointestinal Assessment (continued)

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TABLE K-1.

Summary of Group-by-Covariate Interactions for Hepatic Function Variables and Porphyrin Determinations Analyzed Continuously

| Variable | Interaction | Stratification | Statistic | Group | | p-Value |
|----------|---|----------------|--------------------|-------------------|-------------------|---------|
| | | | | Ranch | Hand | |
| SGOT | Group-by-Current Alcohol Use (Drinks/day) | <1 | n | 652 | 843 | 0.889 |
| | | | Mean | 32.2 | 32.3 | |
| | | | Adj. Mean 95% C.I. | 33.4 (32.4, 34.4) | 33.4 (32.5, 34.4) | |
| | | 1-4 | n | 275 | 335 | 0.010 |
| | | | Mean | 35.3 | 33.4 | |
| | | | Adj. Mean 95% C.I. | 36.5 (35.1, 38.0) | 34.4 (33.2, 35.7) | |
| | | >4 | n | 76 | 108 | 0.477 |
| | | | Mean | 37.5 | 38.1 | |
| | | | Adj. Mean 95% C.I. | 38.2 (35.7, 40.9) | 39.4 (37.2, 41.8) | |
| SGPT | Group-by-Current Alcohol Use (Drinks/day) | <1 | n | 652 | 843 | 0.011 |
| | | | Mean | 20.5 | 21.9 | |
| | | | Adj. Mean 95% C.I. | 19.8 (18.6, 21.2) | 21.1 (19.8, 22.5) | |
| | | 1-4 | n | 275 | 335 | 0.428 |
| | | | Mean | 23.4 | 22.6 | |
| | | | Adj. Mean 95% C.I. | 22.2 (20.2, 24.3) | 21.5 (19.7, 23.5) | |
| | | >4 | n | 76 | 108 | 0.058 |
| | | | Mean | 23.9 | 27.0 | |
| | | | Adj. Mean 95% C.I. | 23.3 (19.7, 27.5) | 26.7 (22.8, 31.3) | |

TABLE K-1. (continued)

Summary of Group-by-Covariate Interactions for Hepatic Function Variables and Porphyrin Determinations Analyzed Continuously

| Variable | Interaction | Stratification | Statistic | Group | | p-Value |
|----------------------|-------------------------------|-------------------------------------|-----------|----------------|----------------|---------|
| | | | | Ranch | Hand | |
| Alkaline Phosphatase | Group-by-Industrial Chemicals | Exposed to Industrial Chemicals | n | 504 | 681 | <0.001 |
| | | | Mean | 94.8 | 89.9 | |
| | | | Adj. Mean | 102.4 | 97.2 | |
| | | | 95% C.I. | (97.9, 107.2) | (93.1, 101.5) | |
| | | Not Exposed to Industrial Chemicals | n | 499 | 604 | 0.973 |
| | | | Mean | 88.9 | 88.7 | |
| | | | Adj. Mean | 88.5 | 88.5 | |
| | | | 95% C.I. | (84.9, 92.1) | (85.0, 92.1) | |
| LDH | Group-by-Age | Born \geq 1942 | n | 408 | 547 | 0.425 |
| | | | Mean | 122.2 | 121.2 | |
| | | | Adj. Mean | 124.8 | 123.6 | |
| | | | 95% C.I. | (121.9, 127.7) | (121.0, 126.3) | |
| | | Born 1923-1941 | n | 565 | 691 | 0.217 |
| | | | Mean | 123.8 | 125.3 | |
| | | | Adj. Mean | 127.0 | 128.6 | |
| | | | 95% C.I. | (124.5, 129.7) | (126.1, 131.1) | |
| | | Born \leq 1922 | n | 36 | 51 | 0.966 |
| | | | Mean | 135.1 | 135.5 | |
| | | | Adj. Mean | 138.9 | 139.1 | |
| | | | 95% C.I. | (130.8, 147.5) | (132.2, 146.5) | |

TABLE K-1. (continued)

Summary of Group-by-Covariate Interactions for Hepatic Function Variables and Porphyrin Determinations Analyzed Continuously

| Variable | Interaction | Stratification | Statistic | Group | | p-Value |
|---------------|--|----------------|-----------------------|-------------------------|-------------------------|---------|
| | | | | Ranch Hand | Comparison | |
| Triglycerides | Born ≥ 1942 | | n | 406 | 546 | 0.321 |
| | | | Mean | 107.1 | 110.2 | |
| | | | Adj. Mean 95% C.I. | 95.6 (88.0, 103.9) | 99.7 (92.5, 107.4) | |
| | Born 1923-1941 | | n | 561 | 689 | 0.784 |
| | | | Mean | 126.0 | 124.5 | |
| | | | Adj. Mean 95% C.I. | 116.8 (108.6, 125.5) | 115.6 (108.0, 123.8) | |
| | Born ≤ 1922 | | n | 36 | 51 | 0.039 |
| | | | Mean | 139.0 | 105.6 | |
| | | | Adj. Mean 95% C.I. | 130.7 (105.4, 161.9) | 98.3 (81.9, 118.0) | |
| Uroporphyrins | BUN ≤ 14 | | n | 547 | 701 | <0.001 |
| | | | Mean | 16.2 | 18.4 | |
| | | | Adj. Mean 95% C.I. | 16.3 (15.4, 17.4) | 18.6 (17.6, 19.7) | |
| | Group-by-Blood Urea Nitrogen (BUN) BUN > 14 | | n | 453 | 582 | 0.686 |
| | | | Mean | 17.8 | 17.4 | |
| | | | Adj. Mean 95% C.I. | 17.9 (16.8, 19.2) | 17.6 (16.6, 18.7) | |

TABLE K-2.

Summary of Group-by-Covariate Interactions for Hepatic Function Variables
and Porphyrin Determinations Analyzed Categorically

| Variable | Interaction | Stratification | Statistic | Group | | | | Adj. Relative Risk (95% C.I.) | p-Value |
|---------------------|-------------------------------|-------------------------------------|-----------|------------|---------|------------------|---------|-------------------------------|---------|
| | | | | Ranch Hand | | Comparison | | | |
| | | | | Number | Percent | Number | Percent | | |
| Direct Bilirubin | Group-by-Industrial Chemicals | Exposed to Industrial Chemicals | n | 507 | | 683 | | | |
| | | | High | 27 | 5.3 | 20 | 2.9 | | |
| | | | Normal | 480 | 94.7 | 663 | 97.1 | 1.89 (1.05,3.42) | 0.035 |
| | | Not Exposed to Industrial Chemicals | n | 496 | | 603 | | | |
| | | | High | 11 | 2.2 | 23 | 3.8 | | |
| | | | Normal | 485 | 97.8 | 580 | 96.2 | 0.58 (0.28,1.20) | 0.143 |
| Triglycerides | Group-by-Occupation | Officer | n | 376 | | 484 | | | |
| | | | High | 34 | 9.0 | 26 | 5.4 | | |
| | | | Normal | 342 | 91.0 | 458 | 94.6 | 1.77 (1.04,3.01) | 0.035 |
| | | Enlisted Flyer | n | 177 | | 209 | | | |
| | | | High | 15 | 8.5 | 14 | 6.7 | | |
| | | | Normal | 162 | 91.5 | 195 | 93.3 | 1.27 (0.59,2.71) | 0.539 |
| Enlisted Groundcrew | n | 456 | | 596 | | | | | |
| | High | 19 | 4.2 | 39 | 6.5 | | | | |
| | Normal | 437 | 95.8 | 557 | 93.5 | 0.63 (0.36,1.10) | 0.104 | | |

TABLE K-3.

Unadjusted Categorical Exposure Index Analyses for Hepatic Function Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|---------------------|---------------------|-----------|----------------|---------|--------|---------|--------|---------|-------------------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| SGT | Officer | n | 126 | | 130 | | 120 | | Overall | | 0.519 |
| | | Abnormal | 9 | 7.1 | 14 | 10.8 | 9 | 7.5 | M vs. L | 1.57 (0.65, 3.77) | 0.384 |
| | | Normal | 117 | 92.9 | 116 | 89.2 | 111 | 92.5 | H vs. L | 1.05 (0.40, 2.75) | 0.999 |
| | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.234 |
| | | Abnormal | 1 | 1.8 | 6 | 9.2 | 4 | 7.0 | M vs. L | 5.49 (0.64, 47.09) | 0.123 |
| | | Normal | 54 | 98.2 | 59 | 90.8 | 53 | 93.0 | H vs. L | 4.08 (0.44, 37.67) | 0.364 |
| Enlisted Groundcrew | n | 154 | | 160 | | 142 | | Overall | | 0.065 | |
| | Abnormal | 7 | 4.5 | 13 | 8.1 | 17 | 12.0 | M vs. L | 1.86 (0.72, 4.79) | 0.249 | |
| | Normal | 147 | 95.5 | 147 | 91.9 | 125 | 88.0 | H vs. L | 2.86 (1.15, 7.11) | 0.031 | |
| SGT | Officer | n | 126 | | 130 | | 120 | | Overall | | 0.669 |
| | | Abnormal | 22 | 17.5 | 20 | 15.4 | 16 | 13.3 | M vs. L | 0.86 (0.44, 1.67) | 0.736 |
| | | Normal | 104 | 82.5 | 110 | 84.6 | 104 | 86.7 | H vs. L | 0.73 (0.36, 1.46) | 0.384 |
| | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.105 |
| | | Abnormal | 2 | 3.6 | 10 | 15.4 | 6 | 10.5 | M vs. L | 4.82 (1.01, 23.03) | 0.037 |
| | | Normal | 53 | 96.4 | 55 | 84.6 | 51 | 89.5 | H vs. L | 3.12 (0.60, 16.17) | 0.272 |
| | Enlisted Groundcrew | n | 154 | | 160 | | 142 | | Overall | | 0.265 |
| | | Abnormal | 17 | 11.0 | 27 | 16.9 | 17 | 12.0 | M vs. L | 1.64 (0.85, 3.14) | 0.147 |
| | | Normal | 137 | 89.0 | 133 | 83.1 | 125 | 88.0 | H vs. L | 1.10 (0.54, 2.24) | 0.856 |

TABLE K-3. (continued)

Unadjusted Categorical Exposure Index Analyses for Hepatic Function Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|----------------------|---------------------|-----------|----------------|---------|--------|---------|--------|---------|----------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| GGTP | Officer | n | 126 | | 130 | | 120 | | Overall | | 0.859 |
| | | Abnormal | 11 | 8.7 | 9 | 6.9 | 9 | 7.5 | M vs. L | 0.78 (0.31,1.95) | 0.646 |
| | | Normal | 115 | 91.3 | 121 | 93.1 | 111 | 92.5 | H vs. L | 0.73 (0.36,1.46) | 0.384 |
| | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.950 |
| | | Abnormal | 5 | 9.1 | 7 | 10.8 | 6 | 10.5 | M vs. L | 1.21 (0.36,4.04) | 0.999 |
| | | Normal | 50 | 90.9 | 58 | 89.2 | 51 | 89.5 | H vs. L | 1.18 (0.34,4.10) | 0.999 |
| | Enlisted Groundcrew | n | 154 | | 160 | | 142 | | Overall | | 0.773 |
| | | Abnormal | 16 | 10.4 | 13 | 8.1 | 14 | 9.9 | M vs. L | 0.76 (0.35,1.64) | 0.561 |
| | | Normal | 138 | 89.6 | 147 | 91.9 | 128 | 90.1 | H vs. L | 0.94 (0.44,2.01) | 0.999 |
| Alkaline Phosphatase | Officer | n | 126 | | 130 | | 120 | | Overall | | 0.448 |
| | | Abnormal | 4 | 3.2 | 7 | 5.4 | 3 | 2.5 | M vs. L | 1.74 (0.50,6.08) | 0.540 |
| | | Normal | 122 | 96.8 | 123 | 94.6 | 117 | 97.5 | H vs. L | 0.78 (0.17,3.57) | 0.999 |
| | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.258 |
| | | Abnormal | 1 | 1.8 | 5 | 7.7 | 5 | 8.8 | M vs. L | 4.50 (0.51,39.74) | 0.217 |
| | | Normal | 54 | 98.2 | 60 | 92.3 | 52 | 91.2 | H vs. L | 5.19 (0.59,45.96) | 0.206 |
| | Enlisted Groundcrew | n | 154 | | 160 | | 142 | | Overall | | 0.378 |
| | | Abnormal | 8 | 5.2 | 10 | 6.3 | 13 | 9.2 | M vs. L | 1.22 (0.47,3.17) | 0.810 |
| | | Normal | 146 | 94.8 | 150 | 93.8 | 129 | 90.8 | H vs. L | 1.84 (0.74,4.58) | 0.257 |

TABLE K-3. (continued)

Unadjusted Categorical Exposure Index Analyses for Hepatic Function Variables by Occupation

| Exposure Index | | | | | | | | | | | |
|------------------|---------------------|-----------|--------|---------|--------|---------|--------|---------|----------|-------------------------------|---------|
| Variable | Occupation | Statistic | Low | | Medium | | High | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Total Bilirubin | Officer | n | 126 | | 130 | | 120 | | Overall | | 0.846 |
| | | Abnormal | 3 | 2.4 | 2 | 1.5 | 3 | 2.5 | M vs. L | 0.64 (0.11, 3.90) | 0.680 |
| | | Normal | 123 | 97.6 | 128 | 98.5 | 117 | 97.5 | H vs. L | 1.05 (0.21, 5.31) | 0.999 |
| | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.353 |
| | | Abnormal | 0 | 0.0 | 1 | 1.5 | 2 | 3.5 | M vs. L | 21.58 (0.10, 64.65) | 0.999 |
| | | Normal | 55 | 100.0 | 64 | 98.5 | 55 | 96.5 | H vs. L | 5.00 (0.24, 106.54) | 0.496 |
| Direct Bilirubin | Enlisted Groundcrew | n | 154 | | 160 | | 142 | | Overall | | 0.374 |
| | | Abnormal | 7 | 4.5 | 3 | 1.9 | 6 | 4.2 | M vs. L | 0.40 (0.10, 1.58) | 0.211 |
| | | Normal | 147 | 95.5 | 157 | 98.1 | 136 | 95.8 | H vs. L | 0.93 (0.30, 2.83) | 0.999 |
| | Officer | n | 126 | | 130 | | 120 | | Overall | | 0.327 |
| | | Abnormal | 2 | 1.6 | 5 | 3.8 | 6 | 5.0 | M vs. L | 2.48 (0.47, 13.02) | 0.447 |
| | | Normal | 124 | 98.4 | 125 | 96.2 | 114 | 95.0 | H vs. L | 3.26 (0.65, 16.50) | 0.164 |
| Direct Bilirubin | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.624 |
| | | Abnormal | 2 | 3.6 | 5 | 7.7 | 3 | 5.3 | M vs. L | 2.21 (0.41, 11.86) | 0.451 |
| | | Normal | 53 | 96.4 | 60 | 92.3 | 54 | 94.7 | H vs. L | 1.47 (0.24, 9.17) | 0.999 |
| | Enlisted Groundcrew | n | 154 | | 160 | | 142 | | Overall | | 0.834 |
| | | Abnormal | 4 | 2.6 | 6 | 3.8 | 5 | 3.5 | M vs. L | 1.46 (0.40, 5.28) | 0.750 |
| | | Normal | 150 | 97.4 | 154 | 96.3 | 137 | 96.5 | H vs. L | 1.37 (0.36, 5.20) | 0.742 |

TABLE K-4.

Unadjusted Continuous Exposure Index Analyses for Hepatic Function Variables
and Two Porphyrin Determinations by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | Contrast | p-Value |
|----------|------------------------|-----------|----------------|--------------|---------------|----------|---------|
| | | | Low | Medium | High | | |
| SGOT | Officer | n | 126 | 130 | 120 | Overall | 0.695 |
| | | Mean | 33.3 | 34.5 | 33.8 | M vs. L | 0.400 |
| | | 95% C.I. | (31.5, 35.3) | (32.6, 36.5) | (31.9, 35.8) | H vs. L | 0.757 |
| | Enlisted Flyer | n | 55 | 65 | 57 | Overall | 0.289 |
| | | Mean | 30.9 | 33.3 | 33.2 | M vs. L | 0.151 |
| | | 95% C.I. | (28.5, 33.4) | (31.0, 35.8) | (30.7, 35.8) | H vs. L | 0.192 |
| | Enlisted Groundcrew | n | 154 | 160 | 142 | Overall | 0.418 |
| | | Mean | 32.9 | 33.2 | 34.4 | M vs. L | 0.801 |
| | | 95% C.I. | (31.4, 34.5) | (31.7, 34.8) | (32.8, 36.1) | H vs. L | 0.211 |
| SGPT | Officer | n | 126 | 130 | 120 | Overall | 0.712 |
| | | Mean | 22.5 | 22.1 | 21.3 | M vs. L | 0.804 |
| | | 95% C.I. | (20.5, 24.6) | (20.2, 24.2) | (19.4, 23.39) | H vs. L | 0.421 |
| | Enlisted Flyer | n | 55 | 65 | 57 | Overall | 0.061 |
| | | Mean | 18.5 | 21.9 | 22.0 | M vs. L | 0.037 |
| | | 95% C.I. | (16.4, 20.8) | (19.7, 24.5) | (19.6, 24.7) | H vs. L | 0.041 |
| | Enlisted Groundcrew | n | 154 | 160 | 142 | Overall | 0.495 |
| | | Mean | 20.9 | 22.3 | 21.5 | M vs. L | 0.237 |
| | | 95% C.I. | (19.3, 22.6) | (20.7, 24.1) | (19.9, 23.4) | H vs. L | 0.595 |

TABLE K-4. (continued)
Unadjusted Continuous Exposure Index Analyses for Hepatic Function Variables
and Two Porphyrin Determinations by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | Contrast | p-Value |
|----------------------|----------------|-----------|----------------|---------------|---------------|----------|---------|
| | | | Low | Medium | High | | |
| GGTP | Officer | n | 126 | 130 | 120 | Overall | 0.885 |
| | | Mean | 31.4 | 32.7 | 32.6 | M vs. L | 0.653 |
| | | 95% C.I. | (27.8, 35.5) | (29.0, 36.9) | (28.7, 36.9) | H vs. L | 0.688 |
| | Enlisted Flyer | n | 55 | 65 | 57 | Overall | 0.243 |
| | | Mean | 29.7 | 34.9 | 37.1 | M vs. L | 0.225 |
| | | 95% C.I. | (24.6, 35.9) | (29.3, 41.5) | (30.8, 44.7) | H vs. L | 0.104 |
| Enlisted Groundcrew | | n | 154 | 160 | 142 | Overall | 0.412 |
| | | Mean | 34.7 | 33.0 | 31.1 | M vs. L | 0.527 |
| | | 95% C.I. | (31.1, 38.7) | (29.6, 36.7) | (27.8, 34.9) | H vs. L | 0.183 |
| Alkaline Phosphatase | Officer | n | 126 | 130 | 120 | Overall | 0.735 |
| | | Mean | 87.2 | 86.8 | 88.9 | M vs. L | 0.893 |
| | | 95% C.I. | (83.5, 91.1) | (83.2, 90.6) | (85.0, 92.9) | H vs. L | 0.546 |
| | Enlisted Flyer | n | 55 | 65 | 57 | Overall | 0.189 |
| | | Mean | 88.9 | 96.3 | 95.2 | M vs. L | 0.086 |
| | | 95% C.I. | (83.1, 95.0) | (90.5, 102.4) | (89.1, 101.6) | H vs. L | 0.153 |
| Enlisted Groundcrew | | n | 154 | 160 | 142 | Overall | 0.535 |
| | | Mean | 93.2 | 95.1 | 96.2 | M vs. L | 0.484 |
| | | 95% C.I. | (89.7, 96.9) | (91.5, 98.8) | (92.4, 100.2) | H vs. L | 0.270 |

TABLE K-4. (continued)
Unadjusted Continuous Exposure Index Analyses for Hepatic Function Variables
and Two Porphyrin Determinations by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | Contrast | p-Value |
|------------------|---------------------|-----------|----------------|-------------|-------------|----------|---------|
| | | | Low | Medium | High | | |
| Total Bilirubin | Officer | n | 126 | 130 | 120 | Overall | 0.382 |
| | | Mean | 0.76 | 0.73 | 0.77 | M vs. L | 0.324 |
| | | 95% C.I. | (0.72,0.80) | (0.69,0.77) | (0.73,0.81) | H vs. L | 0.722 |
| | Enlisted Flyer | n | 55 | 65 | 57 | Overall | 0.045 |
| | | Mean | 0.66 | 0.73 | 0.76 | M vs. L | 0.092 |
| | | 95% C.I. | (0.61,0.72) | (0.67,0.78) | (0.70,0.83) | H vs. L | 0.014 |
| | Enlisted Groundcrew | n | 126 | 130 | 120 | Overall | 0.373 |
| | | Mean | 0.74 | 0.75 | 0.78 | M vs. L | 0.783 |
| | | 95% C.I. | (0.70,0.78) | (0.71,0.78) | (0.74,0.82) | H vs. L | 0.182 |
| Direct Bilirubin | Officer | n | 126 | 130 | 120 | Overall | 0.606 |
| | | Mean | 0.18 | 0.17 | 0.19 | M vs. L | 0.484 |
| | | 95% C.I. | (0.17,0.21) | (0.16,0.19) | (0.17,0.21) | H vs. L | 0.784 |
| | Enlisted Flyer | n | 55 | 65 | 57 | Overall | 0.684 |
| | | Mean | 0.16 | 0.18 | 0.18 | M vs. L | 0.455 |
| | | 95% C.I. | (0.14,0.20) | (0.15,0.21) | (0.15,0.21) | H vs. L | 0.440 |
| | Enlisted Groundcrew | n | 126 | 130 | 120 | Overall | 0.541 |
| | | Mean | 0.17 | 0.15 | 0.19 | M vs. L | 0.277 |
| | | 95% C.I. | (0.15,0.19) | (0.17,0.20) | (0.16,0.19) | H vs. L | 0.728 |

TABLE K-4. (continued)

Unadjusted Continuous Exposure Index Analyses for Hepatic Function Variables
and Two Porphyrin Determinations by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | Contrast | p-Value |
|-------------|------------------------|-----------|----------------|----------------|----------------|----------|---------|
| | | | Low | Medium | High | | |
| LDH | Officer | n | 126 | 130 | 120 | Overall | 0.489 |
| | | Mean | 125.1 | 124.2 | 121.8 | M vs. L | 0.742 |
| | | 95% C.I. | (121.2, 129.1) | (120.4, 128.1) | (117.9, 125.8) | H vs. L | 0.246 |
| | Enlisted Flyer | n | 55 | 65 | 57 | Overall | 0.118 |
| | | Mean | 120.2 | 117.6 | 126.2 | M vs. L | 0.533 |
| | | 95% C.I. | (114.4, 126.4) | (112.4, 123.3) | (120.2, 132.5) | H vs. L | 0.175 |
| | Enlisted Groundcrew | n | 154 | 160 | 142 | Overall | 0.031 |
| | | Mean | 123.1 | 122.3 | 127.9 | M vs. L | 0.710 |
| | | 95% C.I. | (120.1, 126.2) | (119.4, 125.3) | (124.6, 131.2) | H vs. L | 0.037 |
| | Officer | n | 126 | 130 | 120 | Overall | 0.122 |
| | | Mean | 220.7 | 211.8 | 210.7 | M vs. L | 0.093 |
| | | 95% C.I. | (213.3, 228.3) | (204.8, 219.0) | (203.5, 218.2) | H vs. L | 0.063 |
| Cholesterol | Enlisted Flyer | n | 55 | 65 | 57 | Overall | 0.203 |
| | | Mean | 221.1 | 213.9 | 227.7 | M vs. L | 0.351 |
| | | 95% C.I. | (210.2, 232.6) | (204.2, 224.2) | (216.6, 239.3) | H vs. L | 0.418 |
| | Enlisted Groundcrew | n | 154 | 160 | 142 | Overall | 0.873 |
| | | Mean | 211.4 | 211.1 | 213.3 | M vs. L | 0.984 |
| | | 95% C.I. | (205.4, 217.6) | (205.2, 217.2) | (207.0, 219.8) | H vs. L | 0.677 |

TABLE K-4. (continued)

Unadjusted Continuous Exposure Index Analyses for Hepatic Function Variables
and Two Porphyrin Determinations by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | Contrast | p-Value |
|---------------|------------------------|-----------|----------------|----------------|----------------|----------|---------|
| | | | Low | Medium | High | | |
| Triglycerides | Officer | n | 126 | 130 | 120 | Overall | 0.624 |
| | | Mean | 114.2 | 117.9 | 125.1 | M vs. L | 0.728 |
| | | 95% C.I. | (100.2, 130.1) | (103.8, 134.1) | (109.5, 142.9) | H vs. L | 0.338 |
| | Enlisted Flyer | n | 55 | 65 | 57 | Overall | 0.953 |
| | | Mean | 123.8 | 119.9 | 123.1 | M vs. L | 0.775 |
| | | 95% C.I. | (105.2, 145.7) | (103.2, 139.3) | (104.9, 144.5) | H vs. L | 0.811 |
| | Enlisted Groundcrew | n | 154 | 160 | 142 | Overall | 0.796 |
| | | Mean | 118.7 | 113.8 | 117.9 | M vs. L | 0.528 |
| | | 95% C.I. | (108.1, 130.3) | (103.9, 124.7) | (107.0, 129.9) | H vs. L | 0.919 |

TABLE K-5.

Summary of Adjusted Exposure Index, Analyses Involving Interactions with a Continuous Covariate for Hepatic Function Variables

| Variable | Occupation | Interaction Covariate | p-Value Interaction | Exposure Index Level | Slope | p-Value on Test of Slope Against Null Hypothesis of Zero Slope |
|------------------|---------------------|-----------------------|---------------------|----------------------|--------|--|
| SGOT | Enlisted Flyer | Current Alcohol Use | <0.001 | Low | -0.012 | 0.266 |
| | | | | Medium | 0.068 | 0.004 |
| | | | | High | 0.029 | 0.138 |
| SGOT | Enlisted Groundcrew | Current Alcohol Use | <0.001 | Low | 0.004 | 0.628 |
| | | | | Medium | 0.047 | <0.001 |
| | | | | High | 0.062 | <0.001 |
| SGPT | Enlisted Groundcrew | Current Alcohol Use | 0.006 | Low | -0.026 | 0.097 |
| | | | | Medium | 0.027 | 0.189 |
| | | | | High | 0.071 | 0.013 |
| GGTP | Enlisted Flyer | Current Alcohol Use | 0.003 | Low | 0.022 | 0.455 |
| | | | | Medium | 0.183 | <0.001 |
| | | | | High | 0.154 | 0.006 |
| GGTP | Enlisted Groundcrew | Current Alcohol Use | 0.009 | Low | 0.035 | 0.129 |
| | | | | Medium | 0.091 | <0.001 |
| | | | | High | 0.170 | <0.001 |
| Direct Bilirubin | Enlisted Flyer | Current Alcohol Use | 0.017 | Low | 0.013 | 0.445 |
| | | | | Medium | 0.097 | <0.001 |
| | | | | High | 0.065 | 0.090 |
| Cholesterol | Enlisted Groundcrew | Current Alcohol Use | 0.006 | Low | 0.003 | 0.591 |
| | | | | Medium | -0.008 | 0.285 |
| | | | | High | 0.033 | 0.002 |

TABLE K-5. (continued)

Summary of Adjusted Exposure Index, Analyses Involving Interactions with a Continuous Covariate for Hepatic Function Variables

| Variable | Occupation | Interaction Covariate | p-Value Interaction | Exposure Index Level | Slope | p-Value on Test of Slope Against Null Hypothesis of Zero Slope |
|---------------|---------------------|-----------------------|---------------------|----------------------|--------|--|
| LDH | Enlisted Groundcrew | Current Alcohol Use | 0.025 | Low | -0.005 | 0.322 |
| | | | | Medium | 0.016 | 0.020 |
| | | | | High | 0.003 | 0.728 |
| Triglycerides | Enlisted Flyer | Age | 0.012 | Low | 0.014 | 0.286 |
| | | | | Medium | 0.015 | 0.247 |
| | | | | High | 0.038 | 0.032 |

TABLE K-6.

Summary of Adjusted Exposure Index, Analyses Involving Interactions with a Categorical Covariate for Hepatic Function Variables

| Variable | Occupation | Interaction Covariate | Stratification | Exposure Index Level | Adjusted Mean (n) | Interaction p-Value |
|-----------------|---------------------|-----------------------|----------------|----------------------|-------------------|---------------------|
| Total Bilirubin | Enlisted Groundcrew | Race | Black | Low | 0.63 (14) | 0.007 |
| | | | | Medium | 0.90 (13) | |
| | | | | High | 0.70 (13) | |
| | | | Nonblack | Low | 0.75 (138) | |
| | | | | Medium | 0.73 (147) | |
| | | | | High | 0.80 (127) | |

TABLE K-7.

Unadjusted Analyses for Baseline and
Interval History of Liver Disease by Group
(Verified by Medical Record Review)
(Original Comparisons Only)

| Disease | Statistic | Group | | | | Est. Relative Risk (95% C.I.) | p-Value |
|---------------------------------------|-----------|------------|---------|------------|---------|----------------------------------|---------|
| | | Ranch Hand | | Comparison | | | |
| | | Number | Percent | Number | Percent | | |
| Hepatitis (Viral and Alcoholic) | n | 1,016 | | 955 | | | |
| | Yes | 37 | 3.6 | 34 | 3.6 | 1.02 (0.64,1.65) | 0.999 |
| | No | 979 | 96.4 | 921 | 96.4 | | |
| Jaundice | n | 1,016 | | 955 | | | |
| | Yes | 20 | 2.0 | 21 | 2.2 | 0.89 (0.48,1.66) | 0.754 |
| | No | 996 | 98.0 | 934 | 97.8 | | |
| Cirrhosis | n | 1,016 | | 955 | | | |
| | Yes | 3 | 0.5 | 1 | 0.1 | 2.83 (0.29,27.21) | 0.625 |
| | No | 1,013 | 99.5 | 954 | 99.9 | | |
| Enlarged Liver | n | 1,016 | | 955 | | | |
| | Yes | 17 | 1.7 | 15 | 1.6 | 1.07 (0.53,2.15) | 0.999 |
| | No | 999 | 98.3 | 940 | 98.4 | | |
| Miscel- laneous | n | 1,016 | | 955 | | | |
| | Yes | 17 | 1.7 | 7 | 0.7 | 2.31 (0.95,5.58) | 0.065 |
| Liver Disorders | No | 999 | 98.3 | 948 | 99.3 | | |

TABLE K-8.

Unadjusted Analyses of Enlarged Livers
 Diagnosed at Physical Examination by Group*
 (Original Comparisons Only)

| Group | Enlarged Liver | | | | Total | p-Value |
|------------------------|----------------|---------|--------|---------|-------|---------|
| | Yes | | No | | | |
| | Number | Percent | Number | Percent | | |
| Ranch Hand | 8 | 0.8 | 1,002 | 99.2 | 1,010 | 0.227 |
| Original Comparison | 3 | 0.3 | 950 | 99.7 | 953 | |

*Excludes participants with positive HB_sAg.

TABLE K-9.

Unadjusted Continuous and Categorical Analyses for Hepatic Function Variables
and Two Porphyrin Determinations by Group
(Original Comparisons Only)

| Variable | Statistic | Group | | Est. Relative Risk (95% C.I.) | p-Value |
|-------------------------|----------------------------|------------------------|------------------------|----------------------------------|---------|
| | | Ranch Hand | Original Comparison | | |
| SGOT | n | 1,009 | 952 | — | 0.903 |
| | Mean | 33.5 | 33.4 | | |
| | 95% C.I. | (32.9, 34.1) | (32.8, 34.0) | 0.94 (0.68, 1.30) | 0.701 |
| | Number/% Normal High | 929 92.1% 80 7.9% | 872 91.6% 80 8.4% | | |
| SGPT | n | 1,009 | 952 | — | 0.060 |
| | Mean | 21.6 | 22.5 | | |
| | 95% C.I. | (21.0, 22.3) | (21.8, 23.2) | 0.94 (0.73, 1.22) | 0.651 |
| | Number/% Normal High | 872 86.4% 137 13.6% | 816 85.7% 136 14.3% | | |
| GGT | n | 1,009 | 952 | — | 0.921 |
| | Mean | 32.8 | 32.7 | | |
| | 95% C.I. | (31.4, 34.3) | (31.3, 34.2) | 0.94 (0.69, 1.28) | 0.682 |
| | Number/% Normal High | 919 91.1% 90 8.9% | 862 90.6% 90 9.4% | | |
| Alkaline Phosphatase | n | 1,009 | 952 | — | 0.044 |
| | Mean | 91.8 | 89.7 | | |
| | 95% C.I. | (90.4, 93.3) | (88.3, 91.2) | 1.31 (0.87, 1.97) | 0.205 |
| | Number/% Normal High | 953 94.5% 56 5.5% | 911 95.7% 41 4.3% | | |

TABLE K-9. (continued)
Unadjusted Continuous and Categorical Analyses for Hepatic Function Variables
and Two Porphyrin Determinations by Group
(Original Comparisons Only)

| Variable | Statistic | Group | | Est. Relative Risk (95% C.I.) | p-Value |
|------------------|-----------|------------------------|------------------------|-------------------------------|---------|
| | | Ranch Hand | Original Comparison | | |
| Total Bilirubin | n | 1,009 | 952 | — | 0.772 |
| | Mean | 0.74 (0.73,0.76) | 0.75 (0.73,0.76) | | |
| | 95% C.I. | | | | |
| | Number/% | | | | |
| | Normal | 982 97.3% | 919 96.5% | 0.77 (0.46, 1.28) | 0.310 |
| | High | 27 2.7% | 33 3.5% | | |
| Direct Bilirubin | n | 1,009 | 952 | — | 0.795 |
| | Mean | 0.28 (0.27,0.28) | 0.28 (0.27,0.28) | | |
| | 95% C.I. | | | | |
| | Number/% | | | | |
| | Normal | 971 96.2% | 920 96.6% | 1.13 (0.70, 1.82) | 0.629 |
| | High | 38 3.8% | 32 3.4% | | |
| LDH | n | 1,009 | 952 | — | 0.449 |
| | Mean | 123.5 (122.2,124.8) | 124.3 (122.8,125.7) | | |
| | 95% C.I. | | | | |
| | Number/% | | | | |
| | Normal | 999 99.0% | 941 98.8% | 0.86 (0.36,2.02) | 0.724 |
| | High | 10 1.0% | 11 1.2% | | |
| Cholesterol | n | 1,009 | 952 | — | 0.205 |
| | Mean | 214.3 (211.8,216.8) | 216.7 (214.0,219.3) | | |
| | 95% C.I. | | | | |
| | Number/% | | | | |
| | Normal | 863 85.5% | 778 81.7% | 0.76 (0.60,0.96) | 0.023 |
| | High | 146 14.5% | 174 18.3% | | |

TABLE K-9. (continued)

Unadjusted Continuous and Categorical Analyses for Hepatic Function Variables
and Two Porphyrin Determinations by Group
(Original Comparisons Only)

| Variable | Statistic | Group | | Est. Relative Risk (95% C.I.) | p-Value |
|----------------|-----------------|----------------|---------------------|-------------------------------|---------|
| | | Ranch Hand | Original Comparison | | |
| Triglycerides | n | 1,009 | 952 | — | 0.908 |
| | Mean | 118.5 | 118.1 | | |
| | 95% C.I. | (113.8, 123.3) | (113.4, 122.9) | | |
| | Number/% Normal | 941 93.3% | 891 93.6% | | |
| Uroporphyrin | High | 68 6.7% | 61 6.4% | 1.06 (0.74, 1.51) | 0.767 |
| | n | 1,006 | 949 | — | 0.176 |
| | Mean | 16.9 | 17.7 | | |
| | 95% C.I. | (16.2, 17.7) | (16.9, 18.4) | | |
| Coproporphyrin | n | 1,008 | 950 | | |
| | Mean | 119.1 | 115.0 | | |
| | 95% C.I. | (116.2, 122.0) | (112.0, 118.0) | | |
| | | | | | 0.053 |

— No relative risk or confidence interval given for continuous analyses.

TABLE K-10.

Adjusted Continuous and Categorical Analyses for Hepatic Function Variables
and Two Porphyrin Determinations by Group (Original Comparisons Only)

| Variable | Analysis | Statistic | Group | | Adj. Relative Risk (95% C.I.) | p-Value | Covariate Remarks* |
|----------|----------|-----------|----------------|------------------------|----------------------------------|---------|-----------------------|
| | | | Ranch Hand | Original Comparison | | | |
| SCOT | CC | n | 1,003 | 949 | | | ALC*DC (p<0.001) |
| | | Adj. Mean | 34.69 | 34.64 | | 0.908 | AGE*ALC (p=0.033) |
| | | 95% C.I. | (33.66, 35.75) | (33.61, 35.70) | | | RACE (p=0.003) |
| SCOT | CD | n | 1,003 | 949 | | | RACE (p=0.004) |
| | | Adj. Mean | 35.97 | 35.99 | | 0.974 | ALC (p<0.001) |
| | | 95% C.I. | (34.82, 37.17) | (34.83, 37.18) | | | IC (p=0.032) |
| DD | DD | n | 1,003 | 949 | 0.93 (0.66, 1.29) | 0.655 | DC (p=0.044) |
| | | | | | | | AGE*ALC (p<0.001) |
| | | | | | | | OC*ALC (p<0.001) |
| SPT | CC | n | 1,003 | 949 | | | RACE (p=0.026) |
| | | Adj. Mean | 21.52 | 22.53 | | 0.035 | ALC*DC (p=0.002) |
| | | 95% C.I. | (20.89, 22.17) | (21.86, 23.23) | | | AGE*ALC (p=0.006) |
| SPT | CD | n | 1,003 | 949 | | | ALC*DC (p=0.043) |
| | | Adj. Mean | 21.49 | 22.52 | | 0.032 | AGE*ALC (p=0.008) |
| | | 95% C.I. | (20.21, 22.86) | (21.18, 23.96) | | | |
| DD | DD | n | 1,003 | 949 | 0.91 (0.70, 1.18) | 0.467 | AGE (p=0.008) |
| | | | | | | | ALC (p=0.003) |

TABLE K-10. (continued)

Adjusted Continuous and Categorical Analyses for Hepatic Function Variables
and Two Porphyrin Determinations by Group (Original Comparisons Only)

| Variable | Analysis | Statistic | Group | | Adj. Relative Risk (95% C.I.) | p-Value | Covariate Remarks* |
|-------------------------|----------|-----------------------|----------------|------------------------|----------------------------------|---------|--|
| | | | Ranch Hand | Original Comparison | | | |
| OC | n | Adj. Mean 95% C.I. | 1,003 | 949 | — | 0.941 | ALC*DC (p<0.001) |
| | | | 37.47 | 37.39 | | | ACE*DC (p=0.029) |
| | | | (34.93, 40.20) | (34.84, 40.12) | | | RACE*IC (p=0.005) |
| GGTP | n | Adj. Mean 95% C.I. | 1,003 | 949 | — | 0.932 | ACE*ALC (p=0.006) |
| | | | 42.35 | 42.24 | | | RACE (p<0.001) |
| | | | (38.17, 46.98) | (38.08, 46.86) | | | |
| DD | n | | 1,003 | 949 | 0.94 (0.68, 1.28) | 0.680 | ACE*ALC (p=0.005) RACE (p=0.049) |
| OC | n | Adj. Mean 95% C.I. | 1,003 | 950 | — | 0.020 | RACE*IC (p=0.002) |
| | | | 91.5 | 89.1 | | | WINE (p<0.001) |
| | | | (89.1, 93.9) | (86.8, 91.5) | | | ACE (p<0.001) OCC (p<0.001) |
| Alkaline Phosphatase | n | Adj. Mean 95% C.I. | 1,003 | 950 | — | **** | GRP*IC (p=0.006) |
| | | | **** | **** | | | ACE*IC (p=0.040) |
| | | | **** | **** | | | RACE*IC (p=0.002) WINE (p<0.001) OCC (p<0.001) |
| DD | n | | 1,003 | 950 | 1.39 (0.91, 2.12) | 0.121 | WINE*DC (p=0.010) ACE*IC (p=0.006) RACE*IC (p=0.004) OCC*IC (p=0.011) GRP*IC (marginal) (p=0.052) |

TABLE K-10. (continued)

Adjusted Continuous and Categorical Analyses for Hepatic Function Variables
and Two Porphyrin Determinations by Group (Original Comparisons Only)

| Variable | Analysis | Statistic | Group | | Adj. Relative Risk (95% C.I.) | p-Value | Covariate Remarks* |
|---------------------|----------|-----------------------|--------------------------|------------------------|----------------------------------|---------|--|
| | | | Ranch Hand | Original Comparison | | | |
| Total Bilirubin | CC | n | 1,003 | 949 | 0.714 | 0.714 | OCC*RACE (p=0.002) ALC*RACE (p=0.008) AGE*DC (p=0.043) |
| | | Adj. Mean 95% C.I. | 0.78 (0.75,0.81) | 0.78 (0.75,0.82) | | | |
| | CD | n | 1,003 | 949 | 0.774 | 0.774 | OCC*RACE (p=0.003) OCC*ALC (p=0.047) RACE*ALC (p=0.002) |
| | | Adj. Mean 95% C.I. | 0.84 (0.80,0.88) | 0.84 (0.80,0.88) | | | |
| Direct Bilirubin | DD | n | 1,009 | 952 | 0.314 | 0.314 | RACE (p<0.001) |
| | | | | | | | |
| | CC | n | 1,003 | 949 | 0.746 | 0.746 | ALC (p<0.001) |
| | | Adj. Mean 95% C.I. | (0.278) (0.271,0.285) | 0.276 (0.269,0.283) | | | |
| Direct Bilirubin | CD | n | 1,003 | 949 | 0.673 | 0.673 | IC*DC (p=0.014) ALC*DC (p=0.012) ALC*RACE (p=0.030) ALC*OCC (p=0.007) |
| | | Adj. Mean 95% C.I. | 0.308 (0.291,0.325) | 0.305 (0.288,0.323) | | | |
| | DD | n | 1,003 | 949 | **** | **** | CRP*IC (p=0.010) RACE (p=0.014) ALC (p=0.016) |
| | | | | | | | |

TABLE K-10. (continued)

Adjusted Continuous and Categorical Analyses for Hepatic Function Variables
and Two Porphyrin Determinations by Group (Original Comparisons Only)

| Variable | Analysis | Statistic | Group | | Adj. Relative Risk (95% C.I.) | p-Value | Covariate Remarks* |
|-------------|----------|-----------|----------------|------------------------|----------------------------------|---------|-----------------------|
| | | | Ranch Hand | Original Comparison | | | |
| LDH | OC | n | 1,009 | 952 | — | **** | GRP*AGE (p=0.038) |
| | | Adj. Mean | **** | **** | | | IC*AGE (p=0.029) |
| | | 95% C.I. | **** | **** | | | IC*OC (p=0.049) |
| LDH | OD | n | 1,009 | 952 | — | 0.555 | AGE (p<0.001) |
| | | Adj. Mean | 129.4 | 130.0 | | | RACE (p=0.006) |
| | | 95% C.I. | (126.5, 132.2) | (127.2, 132.9) | | | |
| LDH | DD | n | 1,003 | 949 | 0.85 (0.36, 2.01) | 0.706 | ALC (p=0.046) |
| | | | | | | | |
| | | | | | | | |
| OC | OC | n | 1,003 | 949 | — | 0.301 | OC*AGE (p=0.003) |
| | | Adj. Mean | 219.3 | 221.3 | | | DC*AGE (p=0.006) |
| | | 95% C.I. | (214.1, 224.6) | (216.0, 226.6) | | | AGE (p<0.001) |
| Cholesterol | OD | n | 1,003 | 949 | — | 0.243 | ALC (p<0.001) |
| | | Adj. Mean | 223.7 | 226.0 | | | IC (p=0.016) |
| | | 95% C.I. | (217.3, 230.3) | (219.6, 232.5) | | | |
| DD | DD | n | 1,003 | 949 | 0.74 (0.58, 0.94) | 0.015 | OC*AGE (p=0.029) |
| | | | | | | | ALC (p<0.001) |
| | | | | | | | AGE (p<0.001) |
| DD | DD | n | 1,003 | 949 | 0.74 (0.58, 0.94) | 0.015 | RACE*ALC (p=0.009) |
| | | | | | | | AGE (p=0.020) |
| | | | | | | | OC (p=0.037) |

TABLE K-10. (continued)

Adjusted Continuous and Categorical Analyses for Hepatic Function Variables
and Two Porphyrin Determinations by Group (Original Comparisons Only)

| Variable | Analysis | Statistic | Group | | Adj. Relative Risk (95% C.I.) | p-Value | Covariate Remarks* |
|---------------|----------|-----------|----------------|------------------------|----------------------------------|---------|---|
| | | | Ranch Hand | Original Comparison | | | |
| OC | | n | 1,003 | 949 | — | *** | GRP*ACE (p=0.012) ALC (p<0.001) RACE (p<0.001) OCC (p<0.001) |
| | | Adj. Mean | **** | **** | | | |
| | | 95% C.I. | **** | **** | | | |
| Triglycerides | OD | n | 1,003 | 949 | — | 0.904 | OCC (p<0.001) RACE (p<0.001) ACE (p<0.001) ALC (p=0.007) |
| | | Adj. Mean | 112.7 | 112.3 | | | |
| | | 95% C.I. | (103.4, 122.9) | (103.1, 122.4) | | | |
| DD | | n | 1,003 | 949 | 1.06 (0.74, 1.51) | 0.770 | ACE*ALC (p=0.023) RACE (p=0.044) |
| | | | | | | | |
| Uroporphyrin | OC | n | 1,000 | 946 | — | *** | GRP*BUN (p=0.014) OCC*DC (p=0.006) ALC (p=0.048) |
| | | Adj. Mean | **** | **** | | | |
| | | 95% C.I. | **** | **** | | | |

TABLE K-10. (continued)

Adjusted Continuous and Categorical Analyses for Hepatic Function Variables
and Two Porphyrin Determinations by Group (Original Comparisons Only)

| Variable | Analysis | Statistic | Group | | | Adj. Relative Risk (95% C.I.) | p-Value | Covariate Remarks* |
|---------------|----------|-----------|----------------|------|------------------------|----------------------------------|---------|-----------------------|
| | | | Rand | Hand | Original Comparison | | | |
| Coprotophyrin | OC | n | 1,002 | | 947 | | | ALC (p<0.001) |
| | | Adj. Mean | 119.1 | | 115.2 | | 0.066 | BUN (p<0.001) |
| | | 95% C.I. | (116.2, 121.9) | | (112.4, 118.2) | | | |

*Abbreviations:

GRP: group
 OC: occupation
 ALC: current alcohol use
 WINE: wine consumption
 DC: exposure to degreasing chemicals
 IC: exposure to industrial chemicals
 BUN: blood urea nitrogen

— No relative risk or confidence interval given for continuous analyses.

***Group-by-covariate interaction—adjusted mean/relative risk, confidence interval, and p-value not presented.

TABLE K-11.
Summary of Group-by-Covariate Interactions for Hepatic Function Variables
(Original Comparisons Only)

| Variable | Interaction | Stratification | Statistic | Group | | p Value |
|----------------------|-------------------------------|-------------------------------------|-----------|----------------|---------------------|---------|
| | | | | Ranch Hand | Original Comparison | |
| Alkaline Phosphatase | Group-by-Industrial Chemicals | Exposed to Industrial Chemicals | n | 504 | 506 | 0.001 |
| | | | Mean | 94.8 | 90.0 | |
| | | | Adj. Mean | 96.9 | 92.1 | |
| | | | 95% C.I. | (93.5, 100.6) | (88.8, 95.5) | |
| | | Not Exposed to Industrial Chemicals | n | 499 | 444 | 0.608 |
| | | | Mean | 88.9 | 89.5 | |
| | | | Adj. Mean | 92.5 | 93.3 | |
| | | | 95% C.I. | (89.3, 95.8) | (90.0, 96.7) | |
| LDH | Group-by-Age | Born \geq 1942 | n | 408 | 369 | 0.246 |
| | | | Mean | 122.2 | 121.7 | |
| | | | Adj. Mean | 124.1 | 123.6 | |
| | | | 95% C.I. | (121.1, 127.1) | (120.6, 126.7) | |
| | | Born 1923-1941 | n | 6 | 7 | 0.999 |
| | | | Mean | 126.6 | 127.6 | |
| | | | Adj. Mean | 126.6 | 127.6 | |
| | | | 95% C.I. | (123.7, 129.1) | (125.1, 130.7) | |
| | | Born \leq 1922 | n | 36 | 45 | 0.913 |
| | | | Mean | 135.1 | 134.6 | |
| | | | Adj. Mean | 138.0 | 137.4 | |
| | | | 95% C.I. | (129.9, 146.5) | (130.1, 145.1) | |

TABLE K-11.

Summary of Group-by-Covariate Interactions for Hepatic Function Variables (continued)
(Original Comparisons Only)

| Variable | Interaction | Stratification | Statistic | Group | | p Value |
|---------------|--------------|------------------|-----------|------------------|---------------------|---------|
| | | | | Ranch Hand | Original Comparison | |
| Triglycerides | Group-by-Age | Born ≥ 1942 | n | 406 | 368 | |
| | | | Mean | 107.14 | 110.24 | |
| | | | Adj. Mean | 95.55 | 98.49 | 0.055 |
| | | | 95% C.I. | (87.62, 104.20) | (90.12, 107.63) | |
| | | Born 1923-1941 | n | 561 | 536 | |
| | | | Mean | 125.98 | 124.23 | |
| | | | Adj. Mean | 116.13 | 115.14 | 0.815 |
| | | | 95% C.I. | (107.39, 131.47) | (106.66, 134.31) | |
| | | Born ≤ 1922 | n | 36 | 45 | |
| | | | Mean | 139.00 | 106.00 | |
| | | | Adj. Mean | 139.40 | 83.40 | 0.015 |
| | | | 95% C.I. | (106.06, 161.94) | (81.89, 119.89) | |
| Uroporphyrin | Group by BUN | BUN ≤ 30 | n | 547 | 509 | |
| | | | Mean | 16.22 | 16.18 | |
| | | | Adj. Mean | 16.39 | 16.45 | 0.125 |
| | | | 95% C.I. | (15.41, 17.44) | (15.33, 19.65) | |
| | | BUN > 30 | n | 453 | 507 | |
| | | | Mean | 17.39 | 17.15 | |
| | | | Adj. Mean | 18.02 | 17.94 | 0.409 |
| | | | 95% C.I. | (16.85, 19.19) | (16.80, 18.67) | |

TABLE K 12.

Summary of Group by-Covariate Interactions for Variables and
and Porphyrin Determinations Analyzed Categorically
(Original Comparisons Only)

| Variable | Interaction | Stratification | Statistic | Group | | | | Adj. Relative Risk (95% C.I.) | p Value |
|------------------|-------------------------------|-------------------------------------|-----------|------------|---------|------------|---------|-------------------------------|---------|
| | | | | Ranch Hand | | Comparison | | | |
| | | | | Number | Percent | Number | Percent | | |
| Direct Bilirubin | Group-by-Industrial Chemicals | Exposed to Industrial Chemicals | n | 507 | | 506 | | | |
| | | | High | 27 | 5.3 | 14 | 2.8 | | |
| | | | Normal | 480 | 94.7 | 492 | 97.2 | 1.96 (1.02, 3.80) | 0.045 |
| | | Not Exposed to Industrial Chemicals | n | 496 | | 443 | | | |
| | | | High | 11 | 2.2 | 18 | 4.1 | | |
| | | | Normal | 485 | 97.8 | 425 | 95.9 | 0.53 (0.25,1.15) | 0.107 |

TABLE K-13.

Unadjusted Analysis for Interval History of Skin Bruises,
Skin Patches, or Skin Sensitivity by Group
(Original Comparisons Only)

| Group | Bruises, Patches, or Sensitivity | | | | Total | p-Value |
|------------------------|----------------------------------|---------|--------|---------|-------|---------|
| | Yes | | No | | | |
| | Number | Percent | Number | Percent | | |
| Ranch Hand | 265 | 26.2 | 746 | 73.8 | 1,011 | 0.003 |
| Original Comparison | 195 | 20.5 | 758 | 79.5 | 953 | |

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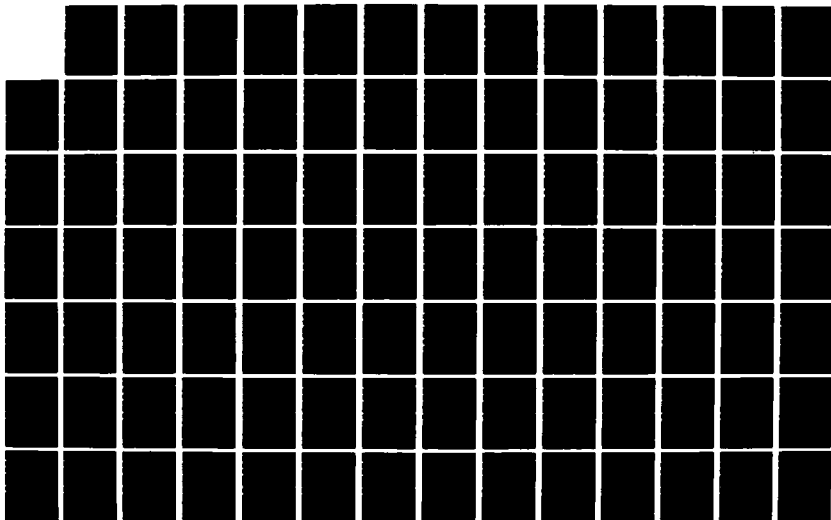
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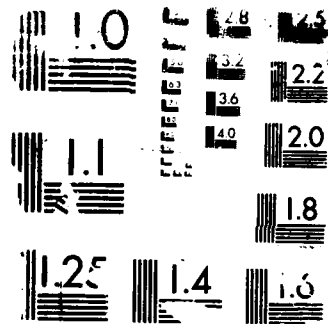
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TABLE K-14.

Unadjusted Analyses for Porphyrin Abnormalities by Group and Skin Patch, Bruise, or Sensitivity Reported at Followup Questionnaire
(Original Comparisons Only)

| Group | Skin Patch, Bruise, or Reported Sensitivity | Abnormal Porphyrin Findings for a Participant | | | | | | Total | p-Value* |
|------------------------|--|---|---------|--------|---------|--------|---------|-------|----------|
| | | 0 | | 1 | | 2 | | | |
| | | Number | Percent | Number | Percent | Number | Percent | | |
| Both Groups | Yes | 412 | 89.8 | 45 | 9.8 | 2 | 0.4 | 459 | 0.754 |
| | No | 1,361 | 91.0 | 129 | 8.6 | 6 | 0.4 | 1496 | |
| Ranch Hand | Yes | 239 | 90.5 | 24 | 9.1 | 1 | 0.4 | 264 | 0.950 |
| | No | 670 | 90.3 | 70 | 9.4 | 2 | 0.3 | 742 | |
| Original Comparison | Yes | 173 | 88.7 | 21 | 10.8 | 1 | 0.5 | 195 | 0.419 |
| | No | 691 | 91.6 | 59 | 7.8 | 4 | 0.5 | 754 | |

*Chi-square test, 2 d.f.

TABLE K-15.

Unadjusted Analyses for Uroporphyrin Abnormalities by Skin Patch, Bruise,
or Sensitivity Reported at Followup Questionnaire and by Group
(Original Comparisons Only)

| Variable | Stratification | Statistic | Group | | | | Est. Relative Risk (95% C.I.) | p-Value |
|---------------|---|-----------|------------|---------|---------------------|---------|-------------------------------|---------|
| | | | Ranch Hand | | Original Comparison | | | |
| | | | Number | Percent | Number | Percent | | |
| Uroporphyrins | Skin Patch, Bruise, or Sensitivity Reported | n | 264 | | 195 | | | |
| | | Abnormal | 12 | 4.5 | 9 | 4.6 | | |
| | | Normal | 252 | 95.5 | 186 | 95.4 | 0.98 (0.41, 2.38) | 0.999 |
| | Skin Patch, Bruise, or Sensitivity Not Reported | n | 742 | | 754 | | | |
| | | Abnormal | 42 | 5.7 | 40 | 5.3 | | |
| | | Normal | 700 | 94.3 | 714 | 94.7 | 1.07 (0.69, 1.67) | 0.821 |

TABLE K-16.

Longitudinal Results for SGOT, SGPT, and GGTP:
 A Contrast of Baseline and First Followup
 Examination Test Means
 (Original Comparisons Only)

| Variable | Group | Total | Means | | p-Value* (Equality of Difference) |
|----------|------------------------|-------|------------------|------------------|--------------------------------------|
| | | | 1982 Baseline | 1985 Followup | |
| SGOT | Ranch Hand | 971 | 32.91 | 33.73 | 0.90 |
| | Original Comparison | 872 | 32.93 | 33.69 | |
| SGPT | Ranch Hand | 971 | 20.08 | 21.82 | 0.86 |
| | Original Comparison | 872 | 20.51 | 22.36 | |
| GGTP | Ranch Hand | 971 | 39.26 | 33.16 | 0.78 |
| | Original Comparison | 872 | 38.76 | 32.56 | |

*Analyzed in log units.

APPENDIX L
Dermatological Evaluation

APPENDIX L: Dermatological Evaluation

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TABLE L-1.

Unadjusted Exposure Index Analyses for Dermatological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|---------------------|----------------|-----------|----------------|---------|--------|---------|--------|---------|-------------------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Comedones | Officer | n | 127 | | 130 | | 123 | | Overall | | 0.198 |
| | | Abnormal | 19 | 15.0 | 31 | 23.8 | 25 | 20.3 | M vs. L | 1.78 (0.95, 3.35) | 0.084 |
| | | Normal | 108 | 85.0 | 99 | 76.2 | 98 | 79.7 | H vs. L | 1.45 (0.75, 2.80) | 0.320 |
| | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.225 |
| | | Abnormal | 23 | 41.8 | 19 | 29.2 | 16 | 28.1 | M vs. L | 0.58 (0.27, 1.23) | 0.180 |
| | | Normal | 32 | 58.2 | 46 | 70.8 | 41 | 71.9 | H vs. L | 0.54 (0.25, 1.19) | 0.165 |
| Enlisted Groundcrew | n | 154 | | 163 | | 142 | | Overall | | 0.393 | |
| | Abnormal | 40 | 26.0 | 36 | 22.1 | 41 | 28.9 | M vs. L | 0.81 (0.48, 1.35) | 0.433 | |
| | Normal | 114 | 74.0 | 127 | 77.9 | 101 | 71.1 | H vs. L | 1.16 (0.69, 1.93) | 0.603 | |
| Acneiform Lesions | Officer | n | 127 | | 130 | | 123 | | Overall | | 0.720 |
| | | Abnormal | 19 | 15.0 | 21 | 16.2 | 23 | 18.7 | M vs. L | 1.10 (0.56, 2.15) | 0.864 |
| | | Normal | 108 | 85.0 | 109 | 83.8 | 100 | 81.3 | H vs. L | 1.31 (0.67, 2.54) | 0.500 |
| | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.994 |
| | | Abnormal | 8 | 14.5 | 9 | 13.8 | 8 | 14.0 | M vs. L | 0.94 (0.34, 2.64) | 0.999 |
| | | Normal | 47 | 85.5 | 56 | 86.2 | 49 | 86.0 | H vs. L | 0.96 (0.33, 2.77) | 0.999 |
| Enlisted Groundcrew | n | 154 | | 163 | | 142 | | Overall | | 0.806 | |
| | Abnormal | 31 | 20.1 | 36 | 22.1 | 33 | 23.2 | M vs. L | 1.13 (0.66, 1.93) | 0.682 | |
| | Normal | 123 | 79.9 | 127 | 77.9 | 109 | 76.8 | H vs. L | 1.20 (0.69, 2.09) | 0.573 | |

TABLE L-1. (continued)

Unadjusted Exposure Index Analyses for Dermatological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|-----------------|---------------------|-----------|----------------|---------|--------|---------|--------|---------|----------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Acneiform Scars | Officer | n | 127 | | 130 | | 123 | | Overall | | 0.175 |
| | | Abnormal | 7 | 5.5 | 13 | 10.0 | 15 | 12.2 | M vs. L | 1.91 (0.73,4.94) | 0.245 |
| | Enlisted Flyer | Normal | 120 | 94.5 | 117 | 90.0 | 108 | 87.8 | H vs. L | 2.38 (0.94,6.06) | 0.075 |
| | | n | 55 | | 65 | | 57 | | Overall | | 0.401 |
| | Enlisted Flyer | Abnormal | 12 | 21.8 | 12 | 18.5 | 7 | 12.3 | M vs. L | 0.81 (0.33,1.99) | 0.655 |
| | | Normal | 43 | 78.2 | 53 | 81.5 | 50 | 87.7 | H vs. L | 0.50 (0.18,1.39) | 0.214 |
| Depigmentation | Enlisted Groundcrew | n | 154 | | 163 | | 142 | | Overall | | 0.135 |
| | | Abnormal | 22 | 14.3 | 29 | 17.8 | 33 | 23.2 | M vs. L | 1.30 (0.71,2.38) | 0.446 |
| | Officer | Normal | 132 | 85.7 | 134 | 82.2 | 109 | 76.8 | H vs. L | 1.82 (1.00,3.30) | 0.053 |
| | | n | 127 | | 130 | | 123 | | Overall | | 0.008 |
| | Enlisted Flyer | Abnormal | 14 | 11.0 | 5 | 3.8 | 19 | 15.4 | M vs. L | 0.32 (0.11,0.93) | 0.033 |
| | | Normal | 113 | 89.0 | 125 | 96.2 | 104 | 84.6 | H vs. L | 1.48 (0.70,3.09) | 0.352 |
| Depigmentation | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.509 |
| | | Abnormal | 10 | 18.2 | 7 | 10.8 | 8 | 14.0 | M vs. L | 0.54 (0.19,1.54) | 0.298 |
| | Enlisted Groundcrew | Normal | 45 | 81.8 | 58 | 89.2 | 49 | 86.0 | H vs. L | 0.74 (0.27,2.03) | 0.613 |
| | | n | 154 | | 163 | | 142 | | Overall | | 0.045 |
| | Enlisted Groundcrew | Abnormal | 15 | 9.7 | 7 | 4.3 | 17 | 12.0 | M vs. L | 0.42 (0.17,1.05) | 0.076 |
| | | Normal | 139 | 90.3 | 156 | 95.7 | 125 | 88.0 | H vs. L | 1.26 (0.60,2.63) | 0.578 |

TABLE L-1. (continued)
Unadjusted Exposure Index Analyses for Dermatological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|-------------------|---------------------|-----------|----------------|---------|--------|---------|--------|---------|----------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Inclusion Cysts | Officer | n | 127 | | 130 | | 123 | | Overall | | 0.221 |
| | | Abnormal | 11 | 8.7 | 20 | 15.4 | 13 | 10.6 | M vs. L | 1.92 (0.88,4.19) | 0.125 |
| | | Normal | 116 | 91.3 | 110 | 84.6 | 110 | 89.4 | H vs. L | 1.25 (0.54,2.90) | 0.671 |
| | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.857 |
| | | Abnormal | 6 | 10.9 | 9 | 13.8 | 8 | 14.0 | M vs. L | 1.31 (0.44,3.95) | 0.783 |
| | | Normal | 49 | 89.1 | 56 | 86.2 | 49 | 86.0 | H vs. L | 1.33 (0.43,4.13) | 0.777 |
| | Enlisted Groundcrew | n | 154 | | 163 | | 142 | | Overall | | 0.836 |
| | | Abnormal | 16 | 10.4 | 15 | 9.2 | 16 | 11.3 | M vs. L | 0.87 (0.42,1.84) | 0.850 |
| | | Normal | 138 | 89.6 | 148 | 90.8 | 126 | 88.7 | H vs. L | 1.10 (0.53,2.28) | 0.853 |
| Hyperpigmentation | Officer | n | 127 | | 130 | | 123 | | Overall | | 0.922 |
| | | Abnormal | 23 | 18.1 | 23 | 17.7 | 20 | 16.3 | M vs. L | 0.97 (0.51,1.84) | 0.999 |
| | | Normal | 104 | 81.9 | 107 | 82.3 | 103 | 83.7 | H vs. L | 0.88 (0.46,1.70) | 0.739 |
| | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.579 |
| | | Abnormal | 13 | 23.6 | 13 | 20.0 | 16 | 28.1 | M vs. L | 0.81 (0.34,1.93) | 0.662 |
| | | Normal | 42 | 76.4 | 52 | 80.0 | 41 | 71.9 | H vs. L | 1.26 (0.54,2.95) | 0.669 |
| | Enlisted Groundcrew | n | 154 | | 163 | | 142 | | Overall | | 0.452 |
| | | Abnormal | 41 | 26.6 | 47 | 28.8 | 32 | 22.5 | M vs. L | 1.12 (0.68,1.83) | 0.707 |
| | | Normal | 113 | 73.4 | 116 | 71.2 | 110 | 77.5 | H vs. L | 0.80 (0.47,1.36) | 0.422 |

TABLE L-1. (continued)

Unadjusted Exposure Index Analyses for Dermatological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|---------------------|---------------------|---------------|----------------|---------|--------|---------|--------|---------|----------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Other Abnormalities | Officer | n | 127 | | 130 | | 123 | | Overall | | 0.122 |
| | | Abnormal | 73 | 57.5 | 87 | 67.0 | 85 | 69.1 | M vs. L | 1.50 (0.90,2.49) | 0.125 |
| | | Normal | 54 | 42.5 | 43 | 33.0 | 38 | 30.9 | H vs. L | 1.66 (0.98,2.78) | 0.067 |
| | Enlisted Groundcrew | n | 55 | | 65 | | 57 | | Overall | | 0.071 |
| | | Abnormal | 43 | 78.2 | 43 | 66.2 | 33 | 57.9 | M vs. L | 0.55 (0.24,1.24) | 0.160 |
| | | Normal | 12 | 21.8 | 22 | 33.8 | 24 | 42.1 | H vs. L | 0.38 (0.17,0.88) | 0.027 |
| Dermatology Index | Officer | n | 154 | | 163 | | 142 | | Overall | | 0.237 |
| | | Abnormal | 87 | 56.5 | 78 | 47.9 | 79 | 55.6 | M vs. L | 0.71 (0.45,1.10) | 0.144 |
| | | Normal | 67 | 43.5 | 85 | 52.1 | 63 | 44.4 | H vs. L | 0.97 (0.61,1.53) | 0.907 |
| | Enlisted Flyer | n | 127 | | 130 | | 123 | | Overall | | 0.300 |
| | | >0 (Abnormal) | 46 | 36.2 | 56 | 43.1 | 56 | 45.5 | M vs. L | 1.33 (0.81,2.20) | 0.308 |
| | | 0 (Normal) | 81 | 63.8 | 74 | 56.9 | 67 | 54.5 | H vs. L | 1.47 (0.89,2.44) | 0.157 |
| Enlisted Groundcrew | Enlisted Flyer | n | 55 | | 65 | | 57 | | Overall | | 0.579 |
| | | >0 (Abnormal) | 33 | 60.0 | 34 | 52.3 | 29 | 50.9 | M vs. L | 0.73 (0.35,1.51) | 0.462 |
| | | 0 (Normal) | 22 | 40.0 | 31 | 47.7 | 28 | 49.1 | H vs. L | 0.69 (0.33,1.46) | 0.349 |
| | Enlisted Groundcrew | n | 154 | | 163 | | 142 | | Overall | | 0.348 |
| | | >0 (Abnormal) | 74 | 48.1 | 77 | 47.2 | 78 | 54.9 | M vs. L | 0.97 (0.62,1.50) | 0.911 |
| | | 0 (Normal) | 80 | 51.9 | 86 | 52.8 | 64 | 45.1 | H vs. L | 1.32 (0.83,2.08) | 0.247 |

TABLE L-2.

Interaction Summaries of Adjusted Exposure
Index Analyses of Dermatological Variables

| Variable | Interaction (Occupation) | Stratification | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|---------------------------------|--|----------------|-----------|----------------|---------|--------|---------|--------|---------|------------------------|----------------------------------|---------|
| | | | | Low | | Medium | | High | | | | |
| | | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Acneiform Scars ^a | Nonblack, No pre-SEA Acne | n | 99 | | 77 | | 76 | | Overall | | 0.006* | |
| | | Abnormal | 0 | 0.0 | 6 | 7.8 | 8 | 10.5 | M vs. L | 18.09 (1.00, 326.31)** | 0.006* | |
| | | Normal | 99 | 100.0 | 71 | 92.2 | 68 | 89.5 | H vs. L | 24.69 (1.40, 434.96)** | 0.001* | |
| | Exposure Index-by- Race | n | 25 | | 49 | | 44 | | Overall | | 0.833 | |
| | | Abnormal | 5 | 20.0 | 7 | 14.3 | 6 | 13.6 | M vs. L | 0.73 (0.20, 2.68) | 0.630 | |
| | | Normal | 20 | 80.0 | 42 | 85.7 | 38 | 86.4 | H vs. L | 0.67 (0.17, 2.56) | 0.555 | |
| Acneiform Scars ^a | Black, No pre-SEA Acne | n | 1 | | 2 | | 1 | | Overall | | 0.135* | |
| | | Abnormal | 1 | 100.0 | 0 | 0.0 | 0 | 0.0 | M vs. L | 0.07 (0.001, 5.49)** | 0.333* | |
| | | Normal | 0 | 0.0 | 2 | 100.0 | 1 | 100.0 | H vs. L | 0.11 (0.001, 10.27)** | 0.999* | |
| | Black, pre-SEA Acne (Officer) | n | 1 | | 1 | | 1 | | Overall | | 0.135* | |
| | | Abnormal | 1 | 100.0 | 0 | 0.0 | 1 | 100.0 | M vs. L | 0.11 (0.001, 10.27)** | 0.999* | |
| | | Normal | 0 | 0.0 | 1 | 100.0 | 0 | 0.0 | H vs. L | — | — | |
| Acneiform Scars | No pre-SEA Acne | n | 101 | | 105 | | 99 | | | | | |
| | | Abnormal | 16 | 15.8 | 15 | 14.3 | 16 | 16.2 | M vs. L | 0.86 (0.39, 1.86) | 0.695 | |
| | | Normal | 85 | 84.2 | 90 | 85.7 | 83 | 83.8 | H vs. L | 1.11 (0.51, 2.39) | 0.799 | |
| | Pre-SEA Acne (Enlisted Groundcrew) | n | 51 | | 57 | | 41 | | | | | |
| | | Abnormal | 6 | 11.8 | 14 | 24.6 | 17 | 41.5 | M vs. L | 2.24 (0.79, 6.39) | 0.131 | |
| | | Normal | 45 | 88.2 | 43 | 75.4 | 24 | 58.5 | H vs. L | 5.38 (1.45, 19.96) | 0.012 | |

TABLE L-2. (continued)

Interaction Summaries of Adjusted Exposure
Index Analyses of Dermatological Variables

| Variable | Interaction (Occupation) | Stratification | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|----------------------|---|------------------------------|-----------|----------------|---------|--------|---------|--------|---------|----------|----------------------------------|---------|
| | | | | Low | | Medium | | High | | | | |
| | | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Depigmen- tation | Exposure Index-by- Presence of pre-SEA Acne | No pre-SEA Acne | n | 101 | | 105 | | 99 | | Overall | | 0.314* |
| | | | Abnormal | 13 | 12.9 | 7 | 6.7 | 11 | 11.1 | H vs. L | 0.48 (0.19, 1.27)* | 0.161* |
| | | | Normal | 88 | 87.1 | 98 | 93.3 | 88 | 88.9 | H vs. L | 0.85 (0.36, 1.99)* | 0.828* |
| | (Enlisted Groundcrew) | Pre-SEA Acne | n | 51 | | 57 | | 41 | | Overall | | 0.006* |
| | | | Abnormal | 2 | 3.9 | 0 | 0.0 | 6 | 14.6 | H vs. L | 0.17 (0.01, 3.67)** | 0.221* |
| | | | Normal | 49 | 96.1 | 57 | 100.0 | 35 | 85.4 | H vs. L | 4.20 (0.80, 22.05)* | 0.133* |
| Dermatology Index | Exposure Index-by- Race | Nonblack, No pre-SEA Acne | n | 99 | | 77 | | 76 | | Overall | | 0.025* |
| | | | Abnormal | 32 | 32.3 | 40 | 51.9 | 35 | 46.1 | H vs. L | 2.26 (1.23, 4.18)* | 0.013* |
| | | | Normal | 67 | 67.7 | 37 | 48.1 | 41 | 53.9 | H vs. L | 1.78 (0.96, 3.31)* | 0.084* |
| | Nonblack, pre-SEA Acne | n | 25 | | 49 | | 44 | | Overall | | 0.222* | |
| | | | Abnormal | 12 | 48.0 | 15 | 30.6 | 20 | 45.5 | H vs. L | 0.48 (0.18, 1.29)* | 0.202* |
| | | | Normal | 13 | 52.0 | 34 | 69.4 | 24 | 54.5 | H vs. L | 0.90 (0.34, 2.41)* | 0.999* |
| Dermatology Index | Exposure Index-by- Presence of pre-SEA Acne | Black, No pre-SEA Acne | n | 1 | | 2 | | 1 | | Overall | | 0.135* |
| | | | Abnormal | 1 | 100.0 | 0 | 0.0 | 0 | 0.0 | H vs. L | 0.07 (0.001, 5.49)** | 0.333* |
| | | | Normal | 0 | 0.0 | 2 | 100.0 | 1 | 100.0 | H vs. L | 0.11 (0.001, 10.27)** | 0.999* |
| | Black, pre-SEA Acne | n | 1 | | 1 | | 1 | | Overall | | 0.223* | |
| | | | Abnormal | 1 | 100.0 | 0 | 0.0 | 1 | 100.0 | H vs. L | 0.11 (0.001, 10.27)** | 0.999* |
| | | | Normal | 0 | 0.0 | 1 | 100.0 | 0 | 0.0 | H vs. L | — | — |

TABLE L-2. (continued)

Interaction Summaries of Adjusted Exposure
Index Analyses of Dermatological Variables

FOOTNOTES, Table L-2

^aResults presented for acneiform scars (officers) are based on stratification into the four categories shown. Unadjusted results are presented for all strata except nonblack Ranch Hands with pre-SEA acne. These results are adjusted for age.

*Unadjusted estimate of relative risk and confidence interval, or p-value, based on stratified tables.

**Unadjusted estimate of relative risk and confidence interval calculated after adding 0.5 to each cell.

—No normal participants present in contrast; estimated relative risk, confidence interval and p-value not presented.

Note: Small sample sizes may affect validity of overall p-value.

Note: Results without (*) or (**) are adjusted for all other main effects in model (age, race, presence of pre-SEA acne), unless otherwise noted.

TABLE L-3.

Unadjusted Analysis for Reported Historical
Occurrence of Acne by Group
(Original Comparisons Only)

| Group | Acne | | | | Total | Summary Statistics |
|------------------------|--------|---------|--------|---------|-------|---|
| | Yes | | No | | | |
| | Number | Percent | Number | Percent | | |
| Ranch Hand | 412 | 40.6 | 604 | 59.4 | 1,016 | Est. RR: 1.18 95% C.I.: (0.99,1.42) p-Value: 0.071 |
| Original Comparison | 349 | 36.5 | 606 | 63.5 | 955 | |
| Total | 761 | | 1,210 | | 1,971 | |

TABLE L-4.

Unadjusted Analysis for Reported Historical Occurrence
Relative to 1961 by Group*
(Original Comparisons Only)

| Group | Occurrence of Acne | | | | Total | Summary Statistics |
|------------------------|--------------------|---------|----------|---------|-------|--|
| | Post-1961 | | Pre-1961 | | | |
| | Number | Percent | Number | Percent | | |
| Ranch Hand | 239 | 58.3 | 171 | 41.7 | 410 | Est. RR (for post- 1961 cases): 1.14 95% C.I.: (0.85, 1.52) p-Value: 0.418 |
| Original Comparison | 192 | 55.2 | 156 | 44.8 | 348 | |
| Total | 431 | | 327 | | 758 | |

*Three participants deleted due to missing data on time of occurrence.

TABLE L-5.

**Unadjusted Analysis for Reported Historical Occurrence of Acne
Relative to SEA Tour of Duty for Post-1961 Acne by Group*
(Original Comparisons Only)**

| Group | Post-1961 Acne | | | | | | Total | p-Value |
|------------|----------------|---------|----------|---------|-------------------|---------|-------|---------|
| | Pre-SEA | | Post-SEA | | Pre- and Post-SEA | | | |
| | Number | Percent | Number | Percent | Number | Percent | | |
| Ranch Hand | 58 | 25.4 | 80 | 35.1 | 90 | 39.5 | 228 | 0.155 |
| Original | | | | | | | | |
| Comparison | 48 | 26.2 | 81 | 44.2 | 54 | 29.5 | 183 | |
| Total | 106 | | 161 | | 144 | | 411 | |

*Twenty post-1961 participants with acne deleted due to missing data on time of occurrence.

TABLE L-6.

**Adjusted Analysis for Duration of Acne (in Years)
for Post-1961 Acne by Group***

| Group | Total | Adjusted Mean** | 95% C.I.** | p-Value | Covariate Remarks |
|------------|-------|-----------------|-------------|---------|---------------------------------|
| Ranch Hand | 219 | 8.18 | (7.43,8.96) | 0.070 | Time Reference to SEA (p<0.001) |
| Original | | | | | |
| Comparison | 175 | 7.15 | (6.38,7.97) | | |
| Total | 394 | | | | |

*Seventeen participants deleted due to missing data on time of occurrence.

**Converted from square root scale.

TABLE L-7.

Results Discussed Narratively
in Questionnaire Data Section of Chapter
(Original Comparisons Only)

| Description | p-Value |
|--|---------|
| • Effect due to SEA category in continuous analysis of duration of acne | <0.001 |
| • Interaction between group and SEA category in continuous analysis of duration of acne | 0.286 |
| • Categorical analysis of duration of acne -- p-value for group difference | |
| <u>SEA Category</u> | |
| pre-SEA | 0.718 |
| post-SEA | 0.592 |
| pre- and post-SEA | 0.753 |
| • Intersection of Venn diagram circles (temples, ears, and eyes) -- p-value for group difference | |
| <u>SEA Category</u> | |
| post-SEA and pre- and post-SEA | 0.133 |
| post-SEA | 0.627 |

TABLE L-8.

Unadjusted Analyses for
Dermatological Variables by Group
(Original Comparisons Only)

| Variable | Statistic | Group | | | | Est. Relative Risk (95% C.I.) | p-Value |
|-------------------|-----------|------------|---------|---------------------|---------|-------------------------------|---------|
| | | Ranch Hand | | Original Comparison | | | |
| | | Number | Percent | Number | Percent | | |
| Comedones | n | 1,016 | | 954 | | | |
| | Abnormal | 250 | 24.6 | 253 | 26.5 | | |
| | Normal | 766 | 75.4 | 701 | 73.5 | 0.90 (0.74, 1.11) | 0.352 |
| Acneiform Lesions | n | 1,016 | | 954 | | | |
| | Abnormal | 188 | 18.5 | 159 | 16.7 | | |
| | Normal | 828 | 81.5 | 795 | 83.3 | 1.14 (0.90, 1.43) | 0.288 |
| Acneiform Scars | n | 1,016 | | 954 | | | |
| | Abnormal | 150 | 14.8 | 128 | 13.4 | | |
| | Normal | 866 | 85.2 | 826 | 86.6 | 1.12 (0.87, 1.44) | 0.401 |
| Depigmentation | n | 1,016 | | 954 | | | |
| | Abnormal | 102 | 10.0 | 113 | 11.8 | | |
| | Normal | 914 | 90.0 | 841 | 88.2 | 0.83 (0.63, 1.10) | 0.219 |
| Inclusion Cysts | n | 1,016 | | 954 | | | |
| | Abnormal | 114 | 11.2 | 118 | 12.4 | | |
| | Normal | 902 | 88.8 | 836 | 87.6 | 0.90 (0.68, 1.18) | 0.442 |
| Hyperpigmentation | n | 1,016 | | 954 | | | |
| | Abnormal | 228 | 22.4 | 222 | 23.3 | | |
| | Normal | 788 | 77.6 | 732 | 76.7 | 0.95 (0.77, 1.18) | 0.668 |

TABLE L-8. (continued)

Unadjusted Analyses for
Dermatological Variables by Group
(Original Comparisons Only)

| Variable | Statistic | Group | | | | Est. Relative Risk (95% C.I.) | p-Value |
|---------------------|-----------|------------|---------|---------------------|---------|---|---|
| | | Ranch Hand | | Original Comparison | | | |
| | | Number | Percent | Number | Percent | | |
| Other Abnormalities | n | 1,016 | | 954 | | 1.03 (0.86, 1.23) | 0.783 |
| | Abnormal | 608 | 59.8 | 565 | 59.2 | | |
| | Normal | 408 | 40.2 | 389 | 40.8 | | |
| Dermatology Index | n | 1,016 | | 954 | | Overall 1 vs. 0 0.99 (0.81, 1.20) 2 vs. 0 0.97 (0.73, 1.29) 3 vs. 0 0.91 (0.56, 1.48) 4 vs. 0 1.87 (0.63, 5.49) | 0.816 0.919 0.885 0.711 0.304 |
| | 0 | 533 | 52.5 | 497 | 52.1 | | |
| | 1 | 318 | 31.3 | 301 | 31.6 | | |
| | 2 | 121 | 11.9 | 116 | 12.2 | | |
| | 3 | 34 | 3.3 | 35 | 3.7 | | |
| | 4 | 10 | 1.0 | 5 | 0.5 | | |
| | | | | | | | |

TABLE L-9.

Adjusted Analyses for
Dermatological Variables by Group
(Original Comparisons Only)

| Variable | Group | | Adj. Relative Risk (95% C.I.) | p-Value | Covariate Remarks |
|----------------------|---------------------|---------------------------------|----------------------------------|---------|---|
| | Ranch Hand Total | Original Comparison Total | | | |
| Comedones | 1,007 | 946 | 0.93 (0.75, 1.14) | 0.469 | RACE (p<0.001) AGE (p<0.001) OCC*SEA ACNE (p=0.047) |
| Acneiform Lesions | 1,007 | 946 | 1.13 (0.89, 1.43) | 0.315 | AGE (p<0.001) RACE (p=0.034) SEA ACNE (p=0.007) |
| Acneiform Scars | 1,007 | 946 | 1.12 (0.86, 1.45) | 0.417 | AGE (p<0.001) RACE (p<0.001) SEA ACNE (p<0.001) |
| Depigmentation | 1,016 | 954 | 0.83 (0.63, 1.10) | 0.202 | RACE (p=0.010) |
| Inclusion Cysts | 1,016 | 954 | 0.90 (0.68, 1.18)* | 0.442* | -- |
| Hyperpigmentation | 1,007 | 946 | 0.95 (0.76, 1.17) | 0.608 | RACE (p<0.001) SEA ACNE (p=0.008) |

TABLE L-9. (continued)

Adjusted Analyses for
Dermatological Variables by Group
(Original Comparisons Only)

| Variable | Group | | Adj. Relative Risk (95% C.I.) | p-Value | Covariate Remarks |
|------------------------|---------------------|---------------------------------|----------------------------------|---------|---|
| | Ranch Hand Total | Original Comparison Total | | | |
| Other Abnormalities | 1,016 | 954 | 1.07 (0.89, 1.30) | 0.459 | AGE (p<0.001) RACE (p<0.001) |
| Dermatology Index | 1,007 | 946 | **** | **** | OCC (p=0.013) GROUP*SEA ACNE (p=0.030) |

*No significant covariates in adjusted analysis; consequently, estimated relative risk, confidence interval, and p-value are from unadjusted analysis.

***Group-by-covariate interaction; adjusted relative risk, confidence interval, and p-value are not presented.

Abbreviations:

OCC: Occupation

SEA ACNE: Presence of pre-SEA acne

TABLE L-10.

Summary of Group-by-Presence of Pre-SEA Acne
Interaction for Dermatology Index
(Original Comparisons Only)

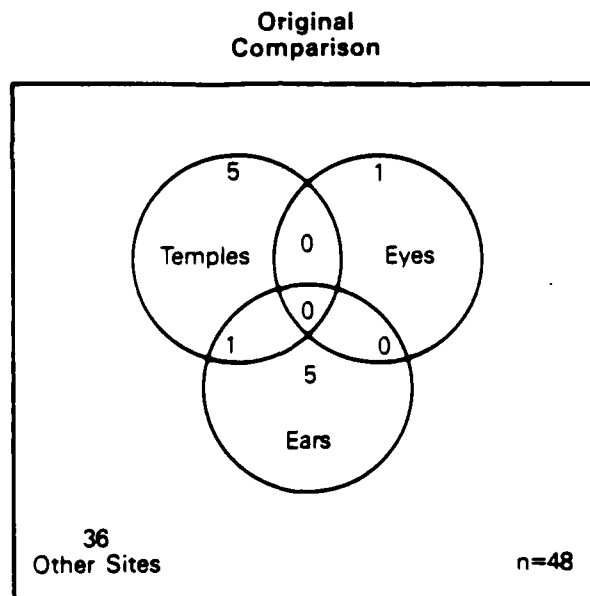
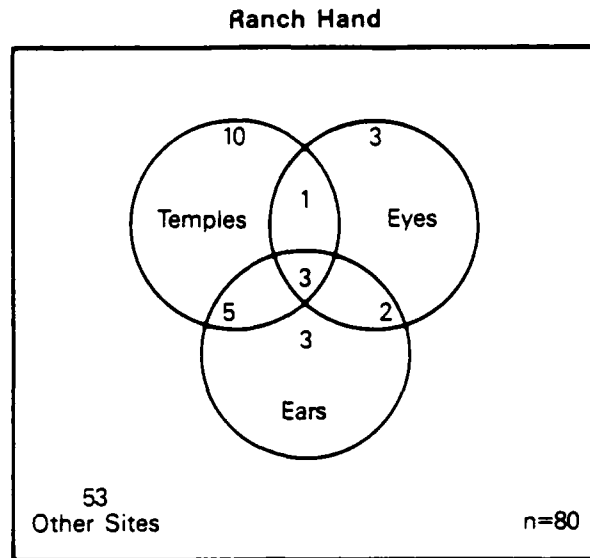
| Variable | Interaction | Stratification | Statistic | Group | | | | Contrast | Adj. Relative Risk (95% C.I.) | p-Value |
|-----------------------|--|----------------|-----------|--------|---------|----------|------------|-------------------|-------------------------------|---------|
| | | | | Ranch | Hand | Original | Comparison | | | |
| | | | | Number | Percent | Number | Percent | | | |
| Dermatology/ Index | Group-by- presence- of-pre-SEA acne | No | n | 684 | | 653 | | | | |
| | | | 0 | 360 | 52.6 | 370 | 56.7 | | | |
| | | | 1 | 234 | 34.2 | 202 | 30.9 | 1 vs. 0 | 1.19 (0.94,1.52) | 0.153 |
| | | | 2 | 69 | 10.1 | 61 | 9.3 | 2 vs. 0 | 1.17 (0.80,1.70) | 0.422 |
| | | 3 | 16 | 2.3 | 19 | 2.9 | 3 vs. 0 | 0.87 (0.44,1.71) | 0.689 | |
| | | 4 | 5 | 0.7 | 1 | 0.2 | 4 vs. 0 | 4.16 (0.61,28.48) | 0.146 | |
| | | n | 323 | | 293 | | | | | |
| | | 0 | 167 | 51.7 | 122 | 41.6 | | | | |
| | Yes | 1 | 82 | 25.4 | 98 | 33.4 | 1 vs. 0 | 0.62 (0.42,0.90) | 0.012 | |
| | | 2 | 51 | 15.8 | 55 | 18.8 | 2 vs. 0 | 0.68 (0.44,1.07) | 0.097 | |
| | | 3 | 18 | 5.6 | 15 | 5.1 | 3 vs. 0 | 0.89 (0.43,1.83) | 0.745 | |
| | | 4 | 5 | 1.5 | 3 | 1.0 | 4 vs. 0 | 1.20 (0.30,4.88) | 0.797 | |

TABLE L-11.

Longitudinal Analysis of the Dermatology Index:
A Contrast of Baseline and First Followup Examination Abnormalities
(Original Comparisons Only)

| Group | 1982 | 1985 Followup Exam | | Odds Ratio (OR)* | p-Value (OR _{RH} vs. OR _{OC}) |
|------------------------|------------------|--------------------|--------|---------------------|---|
| | Baseline Exam | Abnormal | Normal | | |
| Ranch Hand | Abnormal | 241 | 136 | 1.68 | 0.53 |
| | Normal | 228 | 366 | | |
| Original Comparison | Abnormal | 222 | 109 | 1.85 | |
| | Normal | 202 | 339 | | |

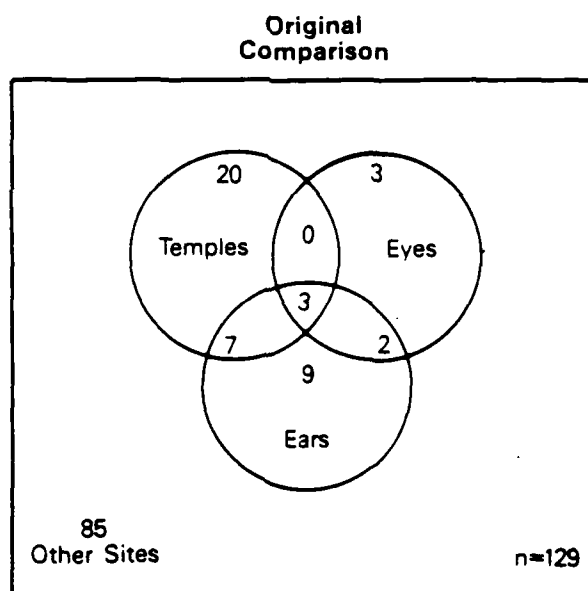
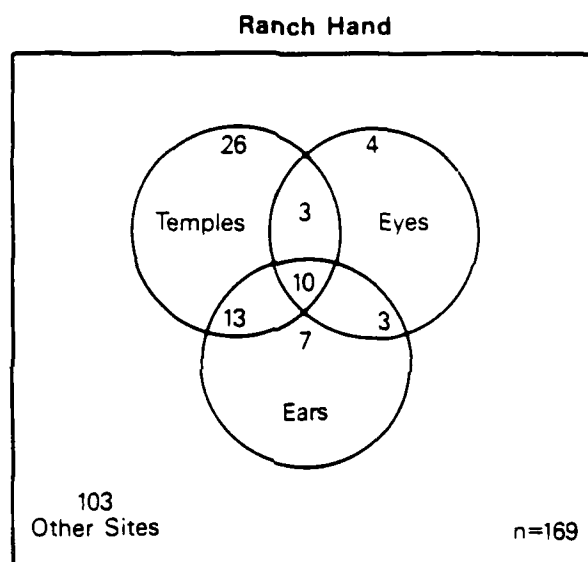
*Odds Ratio:
$$\frac{\text{Number Normal Baseline, Abnormal Followup}}{\text{Number Abnormal Baseline, Normal Followup}}$$



$p = 0.374$
(8 Categories)

$p = 0.310$
(7 Categories;
Other Sites
Deleted)

Figure L-1.
Location of Post-SEA and Pre- and
Post-SEA Acne by Group
(Original Comparisons Only)



p = 0.492
(8 Categories)

p = 0.449
(7 Categories;
Other Sites
Deleted)

Figure L-2.
Location of Post-SEA Acne by Group
(Original Comparisons Only)

APPENDIX M

Cardiovascular Assessment

APPENDIX M: CARDIOVASCULAR ASSESSMENT

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TABLE M-1.

**Association Between Reported Essential Hypertension and the Covariates
in the Combined Ranch Hand and Comparison Groups**

| Covariate | Covariate Category | Total | Percent Abnormal | p-Value |
|----------------------------------|---------------------|-------|------------------|---------|
| Age | Born ≥ 1942 | 934 | 20.4 | <0.001 |
| | Born <1942 | 1,214 | 29.6 | |
| Race | Black | 126 | 27.8 | 0.647 |
| | Nonblack | 2,022 | 25.5 | |
| Occupation | Officer | 807 | 27.6 | 0.108 |
| | Enlisted Flyer | 354 | 27.1 | |
| | Enlisted Groundcrew | 987 | 23.5 | |
| Current Smoking | 0 | 1,262 | 28.8 | <0.001 |
| | >0 - 20 | 463 | 22.0 | |
| | >20 | 422 | 20.4 | |
| Pack-Years Smoking | 0 | 512 | 28.7 | 0.120 |
| | >0 - 10 | 760 | 23.6 | |
| | >10 | 869 | 25.7 | |
| Cholesterol | ≤ 200 | 766 | 19.7 | <0.001 |
| | >200 - 230 | 650 | 26.6 | |
| | >230 | 732 | 31.0 | |
| HDL | ≤ 40 | 719 | 27.5 | 0.309 |
| | >40 - 50 | 754 | 25.3 | |
| | >50 | 675 | 24.0 | |
| Cholesterol-HDL Ratio | ≤ 4.2 | 717 | 20.6 | <0.001 |
| | >4.2 - ≤ 5.5 | 743 | 26.0 | |
| | ≥ 5.5 | 688 | 30.5 | |
| Percent Body Fat | <10 | 10 | 0.0 | <0.001 |
| | 10 - 25 | 1,758 | 21.0 | |
| | >25 | 379 | 47.8 | |
| Personality Score | <-5 | 829 | 26.8 | 0.202 |
| | -5 - 5 | 731 | 26.7 | |
| | >5 | 580 | 22.9 | |
| Differential Cortisol | ≤ 0.6 | 704 | 29.1 | 0.030 |
| | >0.6 - 4.0 | 745 | 24.4 | |
| | >4.0 | 683 | 23.3 | |
| Current Alcohol Use (Drinks/Day) | 0 | 592 | 25.2 | 0.011 |
| | >0 - 1 | 809 | 22.5 | |
| | >1 | 738 | 29.1 | |
| Drink-Years Alcohol | ≤ 1.25 | 691 | 25.9 | 0.005 |
| | >1.25 - 25 | 719 | 21.8 | |
| | >25 | 666 | 29.4 | |

TABLE M-2.

Association Between Reported Heart Disease and the Covariates
in the Combined Ranch Hand and Comparison Groups

| Covariate | Covariate Category | Total | Percent Abnormal | p-Value |
|----------------------------------|---------------------|-------|------------------|---------|
| Age | Born ≥ 1942 | 934 | 22.7 | <0.001 |
| | Born <1942 | 1,214 | 30.3 | |
| Race | Black | 126 | 31.0 | 0.354 |
| | Nonblack | 2,022 | 26.8 | |
| Occupation | Officer | 807 | 30.6 | 0.014 |
| | Enlisted Flyer | 354 | 24.9 | |
| | Enlisted Groundcrew | 987 | 24.8 | |
| Current Smoking | 0 | 1,262 | 27.5 | 0.342 |
| | >0 - 20 | 463 | 28.1 | |
| | >20 | 422 | 24.2 | |
| Pack-Years Smoking | 0 | 512 | 28.1 | 0.667 |
| | >0 - 10 | 760 | 25.9 | |
| | >10 | 869 | 27.3 | |
| Cholesterol | ≤ 200 | 766 | 26.5 | 0.361 |
| | >200 - 230 | 650 | 25.5 | |
| | >230 | 732 | 28.8 | |
| HDL | ≤ 40 | 719 | 26.6 | 0.326 |
| | >40 - 50 | 754 | 25.6 | |
| | >50 | 675 | 29.0 | |
| Cholesterol-HDL Ratio | ≤ 4.2 | 717 | 29.6 | 0.009 |
| | >4.2 - ≤ 5.5 | 743 | 23.0 | |
| | ≥ 5.5 | 688 | 28.6 | |
| Percent Body Fat | <10 | 10 | 30.0 | 0.849 |
| | 10 - 25 | 1,758 | 27.2 | |
| | >25 | 379 | 25.9 | |
| Personality Score | <-5 | 829 | 27.5 | 0.214 |
| | -5 - 5 | 731 | 24.9 | |
| | >5 | 580 | 29.1 | |
| Differential Cortisol | ≤ 0.6 | 704 | 24.6 | 0.212 |
| | >0.6 - 4.0 | 745 | 27.9 | |
| | >4.0 | 683 | 28.4 | |
| Current Alcohol Use (Drinks/Day) | 0 | 592 | 27.4 | 0.297 |
| | >0 - 1 | 809 | 28.6 | |
| | >1 | 738 | 25.1 | |
| Drink-Years Alcohol | ≤ 1.25 | 691 | 26.8 | 0.537 |
| | >1.25 - 25 | 719 | 25.7 | |
| | >25 | 666 | 28.4 | |

TABLE M-3.

**Association Between Reported Myocardial Infarction and the Covariates
in the Combined Ranch Hand and Comparison Groups**

| Covariate | Covariate Category | Total | Percent Abnormal | p-Value |
|----------------------------------|---------------------|-------|------------------|---------|
| Age | Born ≥1942 | 934 | 0.4 | <0.001 |
| | Born <1942 | 1,214 | 3.1 | |
| Race | Black | 126 | 0.8 | 0.523 |
| | Nonblack | 2,022 | 2.0 | |
| Occupation | Officer | 807 | 1.5 | 0.477 |
| | Enlisted Flyer | 354 | 2.3 | |
| | Enlisted Groundcrew | 987 | 2.2 | |
| Current Smoking | 0 | 1,262 | 1.4 | 0.083 |
| | >0 - 20 | 463 | 3.0 | |
| | >20 | 422 | 2.4 | |
| Pack-Years Smoking | 0 | 512 | 0.2 | 0.001 |
| | >0 - 10 | 760 | 1.8 | |
| | >10 | 869 | 3.1 | |
| Cholesterol | ≤200 | 766 | 1.2 | 0.093 |
| | >200 - 230 | 650 | 2.0 | |
| | >230 | 732 | 2.7 | |
| HDL | ≤40 | 719 | 2.8 | 0.096 |
| | >40 - <50 | 754 | 1.9 | |
| | >50 | 675 | 1.2 | |
| Cholesterol-HDL Ratio | ≤4.2 | 717 | 1.0 | 0.002 |
| | >4.2 - <5.5 | 743 | 1.5 | |
| | ≥5.5 | 688 | 3.5 | |
| Percent Body Fat | <10 | 10 | 0.0 | 0.867 |
| | 10 - 25 | 1,758 | 1.9 | |
| | >25 | 379 | 2.1 | |
| Personality Score | <-5 | 829 | 1.9 | 0.195 |
| | -5 - 5 | 731 | 2.6 | |
| | >5 | 580 | 1.2 | |
| Differential Cortisol | ≤0.6 | 704 | 2.0 | 0.973 |
| | >0.6 - 4.0 | 745 | 1.9 | |
| | >4.0 | 683 | 2.0 | |
| Current Alcohol Use (Drinks/Day) | 0 | 592 | 2.4 | 0.365 |
| | >0 - 1 | 809 | 2.1 | |
| | >1 | 738 | 1.4 | |
| Drink-Years Alcohol | ≤1.25 | 691 | 2.6 | 0.034 |
| | >1.25 - 25 | 719 | 0.8 | |
| | >25 | 666 | 2.2 | |

TABLE M-4.

**Cardiovascular Morbidity-Mortality Analysis
(Ranch Hands and Comparisons*)**

| <u>Endpoint</u> | <u>Status</u> | <u>Ranch Hands</u> <u>n=1,257</u> | | | <u>Comparisons*</u> <u>n=1,253</u> | | |
|---|---|--------------------------------------|--------------------|--------------|---------------------------------------|--------------------|--------------|
| | | <u>Event</u> | | | <u>Event</u> | | |
| | | <u>Yes</u> | <u>No</u> | <u>Total</u> | <u>Yes</u> | <u>No</u> | <u>Total</u> |
| Death (Any Cause) or Verified Heart Disease | Dead | 66 | 0 | 66 | 77 | 0 | 77 |
| | Living, Fully Compliant ^a | 251 | 823 | 1,074 | 187 | 768 | 955 |
| | Living, not Fully Compliant ^b | 27.4 ^c | 89.6 ^c | 117 | 43.3 ^c | 177.7 ^c | 221 |
| | Estimated Percent Events | 27.4% | | | 24.5% | | |
| | | | | | | | |
| Death (Any Cause) or Verified Myocardial Infarction | Dead | 66 | 0 | 66 | 77 | 0 | 77 |
| | Living, Fully Compliant ^a | 13 | 1,061 | 1,074 | 9 | 946 | 955 |
| | Living, not Fully Compliant ^b | 1.4 ^c | 115.6 ^c | 117 | 2.1 ^c | 218.9 ^c | 221 |
| | Estimated Percent Events | 6.4% | | | 7.0% | | |
| | | | | | | | |
| Fatal or Nonfatal Verified Heart Disease | Dead | 5 | 61 | 66 | 3 | 74 | 77 |
| | Living, Fully Compliant ^a | 251 | 823 | 1,074 | 187 | 768 | 955 |
| | Living, not Fully Compliant ^b | 27.4 ^c | 89.6 ^c | 117 | 43.3 ^c | 177.7 ^c | 221 |
| | Estimated Percent Events | 22.5% | | | 18.6% | | |
| | | | | | | | |
| Fatal or Nonfatal Verified Myocardial Infarction or Fatal Heart Disease | Dead | 1 | 65 | 66 | 2 | 75 | 77 |
| | Living, Fully Compliant ^a | 13 | 1,061 | 1,074 | 9 | 946 | 955 |
| | Living, not Fully Compliant ^b | 1.4 ^c | 115.6 ^c | 117 | 2.1 ^c | 218.9 ^c | 221 |
| | Estimated Percent Events | 1.2% | | | 1.0% | | |
| | | | | | | | |

*Comparison: first Comparison of the randomly ordered set matched to the Ranch Hands.

^aFully compliant at Baseline or third-year followup examination.

^bNot fully compliant at Baseline and not fully compliant at third-year followup examination.

^cEstimated using event rate in living, fully compliants.

TABLE M-5.

Summary of Group-by-Covariate Interactions
for Central Cardiac Function Variables (Diabetics Excluded)

| Variable | Interaction | Stratification | Adj. Relative Risk (95% C.I.) | p-Value |
|---|---|--------------------|----------------------------------|---------|
| Systolic Blood Pressure (Continuous Analysis) | Group-by-Age (Blacks) | Age (Baseline): 35 | 4.56 (-1.91, 11.03)* | 0.170 |
| | | Age (Baseline): 53 | -16.01 (-27.52, -4.50)* | 0.008 |
| ECG (Overall) | Group-by-Pack-years Smoking | Pack-years: 0 | 0.70 (0.50, 0.98) | 0.038 |
| | | Pack-years: 30 | 1.25 (0.89, 1.76) | 0.197 |
| ECG: Arrhythmia | Group-by-Pack-years Smoking (21% Body Fat) | Pack-years: 0 | 0.58 (0.30, 1.10) | 0.093 |
| | | Pack-years: 30 | 1.59 (0.83, 3.04) | 0.162 |
| | Group-by-Percent Body Fat (7 Pack-years Smoking) | 10% Body Fat | 0.23 (0.07, 0.78) | 0.018 |
| | | 30% Body Fat | 1.88 (0.66, 5.34) | 0.234 |

*Difference in group means (Ranch Hand-Comparison) and associated p-value given, rather than relative risk, for continuous analysis of dependent variables.

TABLE M-6.

Summary of Group-by-Covariate Interactions
for Peripheral Vascular Function Variables (Diabetics Excluded)

| Variable | Interaction | Stratification | Adj. Relative Risk (95% C.I.) | p-Value |
|----------------------------------|---|--|--|-------------------------|
| Popliteal Pulses (Manual) | Group-by-Race | Black Nonblack | 6.74 (0.72, 63.40) 0.55 (0.28, 1.12) | 0.095 0.099 |
| Dorsalis Pedis Pulses (Manual) | Group-by-Occupation | Officer Enlisted Flyer Enlisted Groundcrew | 0.70 (0.45, 1.09) 1.70 (0.86, 3.34) 1.32 (0.84, 2.06) | 0.116 0.124 0.222 |
| Posterior Tibial Pulses (Manual) | Group-by-Occupation | Officer Enlisted Flyer Enlisted Groundcrew | 0.33 (0.09, 1.18) 4.33 (1.14, 16.50) 1.22 (0.58, 2.57) | 0.087 0.032 0.603 |
| Leg Pulses (Manual) | Group-by-Occupation (21% Body Fat) | Officer Enlisted Flyer Enlisted Groundcrew | 0.62 (0.41, 0.94) 1.55 (0.87, 2.76) 1.24 (0.85, 1.81) | 0.026 0.136 0.271 |
| | Group-by-Percent Body Fat (Officer) | Nonobese (<25%) Obese (>25%) | 0.66 (0.42, 1.04) 0.44 (0.17, 1.12) | 0.084 0.072 |
| | Group-by-Percent Body Fat (Enlisted Flyer) | Nonobese (<25%) Obese (>25%) | 1.36 (0.73, 2.55) 1.83 (0.76, 4.38) | 0.177 0.332 |
| | Group-by-Percent Body Fat (Enlisted Groundcrew) | Nonobese (<25%) Obese (>25%) | 1.20 (0.79, 1.83) 0.91 (0.39, 2.10) | 0.818 0.390 |
| Peripheral Pulses (Manual) | Group-by-Occupation | Officer Enlisted Flyer Enlisted Groundcrew | 0.64 (0.42, 0.96) 1.45 (0.82, 2.56) 1.16 (0.80, 1.69) | 0.030 0.204 0.441 |
| All Pulses (Manual) | Group-by-Occupation | Officer Enlisted Flyer Enlisted Groundcrew | 0.64 (0.42, 0.96) 1.45 (0.82, 2.57) 1.14 (0.78, 1.66) | 0.030 0.204 0.490 |

TABLE M-7.

Unadjusted Exposure Index Analyses
for Reported and Verified Heart Disease by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|---------------------------------|---------------------|-----------|----------------|---------|--------|---------|--------|---------|----------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Reported Essential Hypertension | Officer | n | 119 | | 122 | | 109 | | Overall | | 0.850 |
| | | Abnormal | 31 | 26.0 | 33 | 27.0 | 32 | 29.4 | M vs. L | 1.05 (0.59,1.86) | 0.857 |
| | | Normal | 88 | 74.0 | 89 | 73.0 | 77 | 70.6 | H vs. L | 1.18 (0.66,2.11) | 0.575 |
| | Enlisted Flyer | n | 54 | | 56 | | 53 | | Overall | | 0.525 |
| | | Abnormal | 14 | 25.9 | 14 | 25.0 | 18 | 34.0 | M vs. L | 0.95 (0.40,2.48) | 0.912 |
| | | Normal | 40 | 74.1 | 42 | 75.0 | 35 | 66.0 | H vs. L | 1.47 (0.64,3.38) | 0.363 |
| | Enlisted Groundcrew | n | 148 | | 151 | | 130 | | Overall | | 0.490 |
| | | Abnormal | 33 | 22.3 | 42 | 27.8 | 30 | 23.1 | M vs. L | 1.34 (0.79,2.27) | 0.271 |
| | | Normal | 115 | 77.7 | 109 | 72.2 | 100 | 76.9 | H vs. L | 1.05 (0.60,1.83) | 0.881 |
| Verified Essential Hypertension | Officer | n | 119 | | 122 | | 109 | | Overall | | 0.413 |
| | | Abnormal | 23 | 19.3 | 22 | 18.0 | 27 | 24.8 | M vs. L | 0.92 (0.48,1.76) | 0.795 |
| | | Normal | 96 | 80.7 | 100 | 82.0 | 82 | 75.2 | H vs. L | 1.37 (0.73,2.58) | 0.322 |
| | Enlisted Flyer | n | 54 | | 56 | | 53 | | Overall | | 0.514 |
| | | Abnormal | 11 | 20.4 | 8 | 14.3 | 12 | 22.6 | M vs. L | 0.65 (0.24,1.77) | 0.401 |
| | | Normal | 43 | 79.6 | 48 | 85.7 | 41 | 77.4 | H vs. L | 1.14 (0.45,2.88) | 0.772 |
| | Enlisted Groundcrew | n | 148 | | 151 | | 130 | | Overall | | 0.375 |
| | | Abnormal | 28 | 18.9 | 38 | 25.2 | 26 | 20.0 | M vs. L | 1.44 (0.83,2.50) | 0.194 |
| | | Normal | 120 | 81.1 | 113 | 74.8 | 104 | 80.0 | H vs. L | 1.07 (0.59,1.94) | 0.818 |

TABLE M-7. (continued)

Unadjusted Exposure Index Analyses
for Reported and Verified Heart Disease by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|------------------------|---------------------|-----------|----------------|---------|--------|---------|--------|---------|----------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Reported Heart Disease | Officer | n | 119 | | 122 | | 109 | | Overall | | 0.607 |
| | | Abnormal | 41 | 34.4 | 40 | 32.8 | 31 | 28.4 | M vs. L | 0.93 (0.54,1.58) | 0.787 |
| | | Normal | 78 | 65.6 | 82 | 67.2 | 78 | 71.6 | H vs. L | 0.76 (0.43,1.33) | 0.332 |
| | Enlisted Flyer | n | 54 | | 56 | | 53 | | Overall | | 0.306 |
| | | Abnormal | 15 | 27.8 | 19 | 33.9 | 11 | 20.8 | M vs. L | 1.34 (0.59,3.01) | 0.484 |
| | | Normal | 39 | 72.2 | 37 | 66.1 | 42 | 79.2 | H vs. L | 0.68 (0.28,1.66) | 0.401 |
| | Enlisted Groundcrew | n | 148 | | 151 | | 130 | | Overall | | 0.008 |
| | | Abnormal | 42 | 28.4 | 25 | 16.6 | 41 | 31.5 | M vs. L | 0.50 (0.29,0.87) | 0.015 |
| | | Normal | 106 | 71.6 | 126 | 83.4 | 89 | 68.5 | H vs. L | 1.16 (0.70,1.95) | 0.569 |
| Verified Heart Disease | Officer | n | 119 | | 122 | | 109 | | Overall | | 0.665 |
| | | Abnormal | 37 | 31.1 | 35 | 28.7 | 28 | 25.7 | M vs. L | 0.89 (0.51,1.55) | 0.682 |
| | | Normal | 82 | 68.9 | 87 | 71.3 | 81 | 74.3 | H vs. L | 0.77 (0.43,1.37) | 0.368 |
| | Enlisted Flyer | n | 54 | | 56 | | 53 | | Overall | | 0.335 |
| | | Abnormal | 14 | 25.9 | 16 | 28.6 | 9 | 17.0 | M vs. L | 1.14 (0.49,2.65) | 0.757 |
| | | Normal | 40 | 74.1 | 40 | 71.4 | 44 | 83.0 | H vs. L | 0.58 (0.23,1.50) | 0.263 |
| | Enlisted Groundcrew | n | 148 | | 151 | | 130 | | Overall | | 0.002 |
| | | Abnormal | 37 | 25.0 | 16 | 10.6 | 32 | 24.6 | M vs. L | 0.36 (0.19,0.67) | 0.001 |
| | | Normal | 111 | 75.0 | 135 | 89.4 | 98 | 75.4 | H vs. L | 0.98 (0.57,1.76) | 0.994 |

TABLE M-7. (continued)
Unadjusted Exposure Index Analyses
for Reported and Verified Heart Disease by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|---------------------------------|---------------------|-----------|----------------|---------|--------|---------|--------|---------|----------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Reported Myocardial Infarction. | Officer | n | 119 | | 122 | | 109 | | Overall | | 0.256 |
| | | Abnormal | 1 | 0.8 | 4 | 3.3 | 1 | 0.9 | M vs. L | 4.00 (0.44, 36.3) | 0.219 |
| | Enlisted Flyer | n | 118 | 99.2 | 118 | 96.7 | 108 | 99.1 | H vs. L | 1.09 (0.07, 17.7) | 0.952 |
| | | Abnormal | 54 | | 56 | | 53 | | Overall | | 0.061 |
| | Enlisted Groundcrew | n | 0 | 0.0 | 1 | 0.8 | 4 | 7.6 | M vs. L | — | — |
| | | Normal | 54 | 100.0 | 55 | 98.2 | 49 | 92.4 | H vs. L | — | — |
| Verified Myocardial Infarction | Officer | n | 148 | | 151 | | 130 | | Overall | | 0.592 |
| | | Abnormal | 3 | 2.0 | 2 | 1.3 | 4 | 3.1 | M vs. L | 0.65 (0.11, 3.94) | 0.638 |
| | Enlisted Flyer | n | 145 | 98.0 | 149 | 98.7 | 126 | 96.9 | H vs. L | 1.53 (0.34, 6.98) | 0.582 |
| | | Abnormal | 54 | | 56 | | 53 | | Overall | | — |
| | Enlisted Groundcrew | n | 0 | 0.0 | 1 | 1.8 | 1 | 1.9 | M vs. L | — | — |
| | | Normal | 54 | 100.0 | 55 | 98.2 | 52 | 98.1 | H vs. L | — | — |
| Verified Myocardial Infarction | Officer | n | 148 | | 151 | | 130 | | Overall | | — |
| | | Abnormal | 2 | 1.4 | 0 | 0.0 | 1 | 0.8 | M vs. L | — | — |
| | Enlisted Flyer | n | 146 | 98.6 | 151 | 100.0 | 129 | 99.2 | H vs. L | — | — |
| | | Abnormal | 54 | | 56 | | 53 | | Overall | | — |
| | Enlisted Groundcrew | n | 0 | 0.0 | 1 | 1.8 | 1 | 1.9 | M vs. L | — | — |
| | | Normal | 54 | 100.0 | 55 | 98.2 | 52 | 98.1 | H vs. L | — | — |

— Analysis not performed due to sparse cells.

TABLE M-8.

Unadjusted Exposure Index Analyses
for Central Cardiac Function Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|-------------------------|---------------------|-----------|----------------|---------|--------|---------|--------|---------|-------------------|-------------------------------|--------------------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Systolic Blood Pressure | Officer | n | 119 | | 122 | | 109 | | Overall | | 0.996 |
| | | Abnormal | 8 | 6.7 | 8 | 6.6 | 7 | 6.4 | M vs. L | 0.97 (0.35, 2.69) | 0.960 |
| | | Normal | 111 | 93.3 | 114 | 93.4 | 102 | 93.6 | H vs. L | 0.95 (0.34, 2.63) | 0.928 |
| | Enlisted Flyer | n | 54 | | 56 | | 53 | | Overall | | 0.927 |
| | | Abnormal | 4 | 7.4 | 4 | 7.1 | 3 | 5.7 | M vs. L | 0.96 (0.23, 4.05) | 0.960 |
| | | Normal | 50 | 92.6 | 52 | 92.9 | 50 | 94.3 | H vs. L | 0.75 (0.16, 3.53) | 0.719 |
| Enlisted Groundcrew | n | 148 | | 151 | | 130 | | Overall | | 0.166 | |
| | Abnormal | 5 | 3.4 | 13 | 8.6 | 8 | 6.2 | M vs. L | 2.69 (0.94, 7.76) | 0.066 | |
| | Normal | 143 | 96.6 | 138 | 91.4 | 122 | 93.8 | H vs. L | 1.88 (0.60, 5.88) | 0.280 | |
| Heart Sounds | Officer | n | 119 | | 122 | | 109 | | Overall | | 0.844 ^a |
| | | Abnormal | 4 | 3.4 | 4 | 3.3 | 5 | 4.6 | M vs. L | 0.97 (0.24, 3.99) | 0.968 |
| | | Normal | 115 | 96.6 | 118 | 96.7 | 104 | 95.4 | H vs. L | 1.38 (0.36, 5.29) | 0.638 |
| | Enlisted Flyer | n | 54 | | 56 | | 53 | | | | — |
| | | Abnormal | 1 | 1.8 | 2 | 3.6 | 0 | 0.0 | | — | — |
| | | Normal | 53 | 98.2 | 54 | 96.4 | 53 | 100.0 | | — | — |
| | Enlisted Groundcrew | n | 148 | | 150 | | 130 | | Overall | | 0.167 |
| | | Abnormal | 6 | 4.0 | 2 | 1.3 | 7 | 5.4 | M vs. L | 0.32 (0.06, 1.61) | 0.168 |
| | | Normal | 142 | 96.0 | 148 | 98.7 | 123 | 94.6 | H vs. L | 1.35 (0.44, 4.12) | 0.603 |

TABLE M-8. (continued)
Unadjusted Exposure Index Analyses
for Central Cardiac Function Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|---------------------------|---------------------|-----------|----------------|---------|--------|---------|--------|---------|----------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| ECG (Overall) | Officer | n | 119 | | 122 | | 109 | | Overall | | 0.347 |
| | | Abnormal | 13 | 10.9 | 21 | 17.2 | 14 | 12.8 | M vs. L | 1.70 (0.81, 3.57) | 0.165 |
| | | Normal | 106 | 89.1 | 101 | 82.8 | 95 | 87.2 | H vs. L | 1.20 (0.54, 2.69) | 0.653 |
| | Enlisted Flyer | n | 54 | | 56 | | 53 | | Overall | | 0.614 |
| | | Abnormal | 9 | 16.7 | 13 | 23.2 | 9 | 17.0 | M vs. L | 1.51 (0.59, 3.90) | 0.395 |
| | | Normal | 45 | 83.3 | 43 | 76.8 | 44 | 83.0 | H vs. L | 1.02 (0.37, 2.82) | 0.968 |
| | Enlisted Groundcrew | n | 148 | | 151 | | 130 | | Overall | | 0.266 |
| | | Abnormal | 17 | 11.5 | 10 | 6.6 | 15 | 11.5 | M vs. L | 0.55 (0.24, 1.24) | 0.147 |
| | | Normal | 131 | 88.5 | 141 | 93.4 | 115 | 88.5 | H vs. L | 1.01 (0.48, 2.10) | 0.992 |
| Right Bundle Branch Block | Officer | n | 119 | | 122 | | 109 | | | | — |
| | | Abnormal | 0 | 0.0 | 1 | 0.8 | 0 | 0.0 | | — | — |
| | | Normal | 119 | 100.0 | 121 | 99.2 | 109 | 100.0 | | — | — |
| | Enlisted Flyer | n | 54 | | 56 | | 53 | | | | — |
| | | Abnormal | 1 | 1.8 | 0 | 0.0 | 0 | 0.0 | | — | — |
| | | Normal | 53 | 98.2 | 56 | 100.0 | 53 | 100.0 | | — | — |
| | Enlisted Groundcrew | n | 148 | | 151 | | 130 | | | | — |
| | | Abnormal | 1 | 0.7 | 0 | 0.0 | 2 | 1.5 | | — | — |
| | | Normal | 147 | 99.3 | 151 | 100.0 | 128 | 98.5 | | — | — |

TABLE M-8. (continued)

Unadjusted Exposure Index Analyses
for Central Cardiac Function Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value | |
|--------------------------|-------------------------------|-----------|----------------|---------|--------|---------|--------|---------|----------|-------------------------------|------------------|-------|
| | | | Low | | Medium | | High | | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | | |
| Left Bundle Branch Block | Officer | n | 119 | | 122 | | 109 | | | | | |
| | | Abnormal | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | | | | |
| | | Normal | 119 | 100.0 | 122 | 100.0 | 109 | 100.0 | | | | |
| | Enlisted Flyer | n | 54 | | 56 | | 53 | | | | | |
| | | Abnormal | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | | | | |
| | | Normal | 54 | 100.0 | 56 | 100.0 | 53 | 100.0 | | | | |
| | Enlisted Groundcrew | n | 148 | | 151 | | 130 | | | | | |
| | | Abnormal | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | | | | |
| | | Normal | 148 | 100.0 | 151 | 100.0 | 130 | 100.0 | | | | |
| | Nonspecific ST-T Wave Changes | Officer | n | 119 | | 122 | | 109 | | Overall | | 0.340 |
| | | | Abnormal | 8 | 6.7 | 15 | 12.3 | 11 | 10.1 | M vs. L | 1.94 (0.79,4.77) | 0.147 |
| | | | Normal | 111 | 93.3 | 107 | 87.7 | 98 | 89.9 | H vs. L | 1.56 (0.60,4.03) | 0.363 |
| Enlisted Flyer | | n | 54 | | 56 | | 53 | | Overall | | 0.171 | |
| | | Abnormal | 4 | 7.4 | 11 | 19.6 | 7 | 13.2 | M vs. L | 3.06 (0.91,10.28) | 0.072 | |
| | | Normal | 50 | 92.6 | 45 | 80.4 | 46 | 86.8 | H vs. L | 1.90 (0.52,6.92) | 0.327 | |
| Enlisted Groundcrew | | n | 148 | | 151 | | 130 | | Overall | | 0.126 | |
| | | Abnormal | 15 | 10.1 | 7 | 4.6 | 7 | 5.4 | M vs. L | 0.43 (0.17,1.09) | 0.075 | |
| | | Normal | 133 | 89.9 | 144 | 95.4 | 123 | 94.6 | H vs. L | 0.50 (0.20,1.28) | 0.150 | |

TABLE M-8. (continued)
Unadjusted Exposure Index Analyses
for Central Cardiac Function Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|---------------------|---------------------|-----------|----------------|---------|--------|---------|--------|---------|-------------------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Bradycardia | Officer | n | 119 | | 122 | | 109 | | Overall | | 0.975 |
| | | Abnormal | 7 | 5.9 | 8 | 6.6 | 7 | 6.4 | M vs. L | 1.12 (0.39, 3.20) | 0.826 |
| | | Normal | 112 | 94.1 | 114 | 93.4 | 102 | 93.6 | H vs. L | 1.10 (0.37, 3.24) | 0.865 |
| | Enlisted Flyer | n | 54 | | 56 | | 53 | | Overall | | 0.205 |
| | | Abnormal | 1 | 1.8 | 5 | 8.9 | 2 | 3.8 | M vs. L | 5.20 (0.59, 46.04) | 0.139 |
| | | Normal | 53 | 98.2 | 51 | 91.1 | 51 | 96.2 | H vs. L | 2.08 (0.18, 23.63) | 0.555 |
| Enlisted Groundcrew | n | 148 | | 151 | | 130 | | Overall | | 0.078 | |
| | Abnormal | 9 | 6.1 | 2 | 1.3 | 4 | 3.1 | M vs. L | 0.21 (0.04, 0.98) | 0.047 | |
| | Normal | 139 | 93.9 | 149 | 98.7 | 126 | 96.9 | H vs. L | 0.49 (0.15, 1.63) | 0.246 | |
| Tachycardia | Officer | n | 119 | | 122 | | 109 | | | | — |
| | | Abnormal | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | | — | — |
| | | Normal | 119 | 100.0 | 122 | 100.0 | 109 | 100.0 | | — | — |
| | Enlisted Flyer | n | 54 | | 56 | | 53 | | | | — |
| | | Abnormal | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | | — | — |
| | | Normal | 54 | 100.0 | 56 | 100.0 | 53 | 100.0 | | — | — |
| | Enlisted Groundcrew | n | 148 | | 151 | | 130 | | | | — |
| | | Abnormal | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | | — | — |
| | | Normal | 148 | 100.0 | 151 | 100.0 | 130 | 100.0 | | — | — |

TABLE M-8. (continued)

Unadjusted Exposure Index Analyses
for Central Cardiac Function Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|---------------------|---------------------|-----------|----------------|---------|--------|---------|--------|---------|----------|-------------------------------|--------------------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Other ECG Diagnoses | Officer | n | 119 | | 122 | | 109 | | Overall | | 0.311 |
| | | Abnormal | 14 | 11.8 | 21 | 17.2 | 12 | 11.0 | M vs. L | 1.56 (0.75, 3.23) | 0.234 |
| | | Normal | 105 | 88.2 | 101 | 82.8 | 97 | 89.0 | H vs. L | 0.93 (0.41, 2.10) | 0.857 |
| | Enlisted Flyer | n | 54 | | 56 | | 53 | | | | 0.265 |
| | | Abnormal | 9 | 16.7 | 5 | 8.9 | 4 | 7.6 | M vs. L | 0.49 (0.15, 1.57) | 0.230 |
| | | Normal | 45 | 83.3 | 51 | 91.1 | 49 | 92.4 | H vs. L | 0.42 (0.12, 1.42) | 0.159 |
| | Enlisted Groundcrew | n | 148 | | 151 | | 130 | | | | 0.645 |
| | | Abnormal | 13 | 8.8 | 9 | 6.0 | 10 | 7.7 | M vs. L | 0.66 (0.27, 1.59) | 0.352 |
| | | Normal | 135 | 91.2 | 142 | 94.0 | 120 | 92.3 | H vs. L | 0.87 (0.37, 2.04) | 0.741 |
| Arrhythmia | Officer | n | 119 | | 122 | | 109 | | Overall | | 0.166 ^a |
| | | Abnormal | 6 | 5.0 | 3 | 2.5 | 1 | 0.9 | M vs. L | 0.47 (0.12, 1.94) | 0.298 |
| | | Normal | 113 | 95.0 | 119 | 97.5 | 108 | 99.1 | H vs. L | 0.17 (0.02, 1.47) | 0.110 |
| | Enlisted Flyer | n | 54 | | 56 | | 53 | | | | — |
| | | Abnormal | 2 | 3.7 | 0 | 0.0 | 1 | 1.9 | | — | — |
| | | Normal | 52 | 96.3 | 56 | 100.0 | 52 | 98.1 | | — | — |
| | Enlisted Groundcrew | n | 148 | | 151 | | 130 | | Overall | | 0.482 |
| | | Abnormal | 7 | 4.7 | 4 | 2.6 | 7 | 5.4 | M vs. L | 0.55 (0.16, 1.91) | 0.347 |
| | | Normal | 141 | 95.3 | 147 | 97.4 | 123 | 94.6 | H vs. L | 1.15 (0.39, 3.36) | 0.582 |

^aOverall analysis; sparse cells, chi-square test may not be valid.

— Analysis not performed due to sparse cells.

TABLE H-9.

Unadjusted Exposure Index Analyses
for Diastolic Blood Pressure, Fundoscopic Abnormalities,
Carotid Bruits, and Manual Pulse Readings by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|--------------------------|---------------------|-----------|----------------|---------|--------|---------|--------|---------|------------------|-------------------------------|--------------------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Diastolic Blood Pressure | Officer | n | 119 | | 122 | | 109 | | Overall | | 0.585 |
| | | Abnormal | 8 | 6.7 | 7 | 5.7 | 10 | 9.2 | M vs. L | 0.84 (0.30,2.41) | 0.749 |
| | | Normal | 111 | 93.3 | 115 | 94.3 | 99 | 90.8 | H vs. L | 1.40 (0.53,3.69) | 0.497 |
| | Enlisted Flyer | n | 54 | | 56 | | 53 | | Overall | | 0.903 |
| | | Abnormal | 5 | 9.3 | 5 | 8.9 | 6 | 11.3 | M vs. L | 0.96 (0.26,3.53) | 0.952 |
| | | Normal | 49 | 90.7 | 51 | 91.1 | 47 | 88.7 | H vs. L | 1.25 (0.36,4.38) | 0.726 |
| Enlisted Groundcrew | n | 148 | | 151 | | 130 | | Overall | | 0.434 | |
| | Abnormal | 11 | 7.4 | 17 | 11.3 | 10 | 7.7 | M vs. L | 1.58 (0.71,3.50) | 0.258 | |
| | Normal | 137 | 92.6 | 134 | 88.7 | 120 | 92.3 | H vs. L | 1.04 (0.43,2.53) | 0.936 | |
| Fundoscopic Examination | Officer | n | 119 | | 122 | | 109 | | Overall | | 0.337 ^a |
| | | Abnormal | 2 | 1.7 | 0 | 0.0 | 2 | 1.8 | | — | — |
| | | Normal | 117 | 98.3 | 122 | 100.0 | 107 | 98.2 | | — | — |
| | Enlisted Flyer | n | 54 | | 56 | | 53 | | | — | — |
| | | Abnormal | 1 | 1.8 | 0 | 0.0 | 0 | 0.0 | | — | — |
| | | Normal | 53 | 98.2 | 56 | 100.0 | 53 | 100.0 | | | |
| | Enlisted Groundcrew | n | 148 | | 150 | | 130 | | | — | — |
| | | Abnormal | 1 | 0.7 | 0 | 0.0 | 1 | 0.8 | | — | — |
| | | Normal | 147 | 99.3 | 150 | 100.0 | 129 | 99.2 | | — | — |

TABLE M-9. (continued)

Unadjusted Exposure Index Analyses
for Diastolic Blood Pressure, Fundoscopic Abnormalities,
Carotid Bruits, and Manual Pulse Readings by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|----------------|---------------------|-----------|----------------|---------|--------|---------|--------|---------|----------|-------------------------------|--------------------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Carotid Bruits | Officer | n | 120 | | 122 | | 109 | | Overall | — | 0.388 ^a |
| | | Abnormal | 3 | 1.7 | 1 | 0.8 | 0 | 0.0 | | | |
| | | Normal | 117 | 98.3 | 121 | 99.2 | 109 | 100.0 | | | |
| | Enlisted Flyer | n | 54 | | 56 | | 53 | | — | — | — |
| | | Abnormal | 0 | 0.0 | 0 | 0.0 | 2 | 3.8 | | | |
| | | Normal | 54 | 100.0 | 56 | 100.0 | 51 | 96.2 | | | |
| | Enlisted Groundcrew | n | 148 | | 150 | | 130 | | — | — | — |
| | | Abnormal | 0 | 0.0 | 0 | 0.0 | 2 | 1.5 | | | |
| | | Normal | 148 | 100.0 | 150 | 100.0 | 128 | 98.5 | | | |
| Radial Pulses | Officer | n | 118 | | 119 | | 108 | | Overall | — | 0.342 ^a |
| | | Abnormal | 2 | 1.7 | 0 | 0.0 | 2 | 1.8 | | | |
| | | Normal | 116 | 98.3 | 119 | 100.0 | 106 | 98.2 | | | |
| | Enlisted Flyer | n | 54 | | 55 | | 53 | | — | — | — |
| | | Abnormal | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | | | |
| | | Normal | 54 | 100.0 | 55 | 100.0 | 53 | 100.0 | | | |
| | Enlisted Groundcrew | n | 146 | | 149 | | 127 | | — | — | — |
| | | Abnormal | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | | | |
| | | Normal | 146 | 100.0 | 149 | 100.0 | 127 | 100.0 | | | |

TABLE M-9. (continued)

Unadjusted Exposure Index Analyses
for Diastolic Blood Pressure, Fundoscopic Abnormalities,
Carotid Bruits, and Manual Pulse Readings by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|---------------------------------|------------------------|-----------|----------------|---------|--------|---------|--------|---------|----------|-------------------------------|--------------------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Femoral Pulses (Manual) | Officer | n | 118 | | 119 | | 108 | | Overall | | 0.379 ^a |
| | | Abnormal | 1 | 0.8 | 1 | 0.8 | 3 | 2.8 | | — | — |
| | Enlisted Flyer | n | 54 | | 55 | | 53 | | Overall | | 0.334 |
| | | Abnormal | 1 | 1.8 | 2 | 3.6 | 4 | 7.6 | M vs. L | 2.00 (0.18, 22.7) | 0.575 |
| | Enlisted Groundcrew | n | 146 | | 149 | | 127 | | Overall | | 0.088 |
| | | Abnormal | 5 | 3.4 | 0 | 0.0 | 3 | 2.4 | H vs. L | 0.68 (0.16, 2.91) | 0.603 |
| Popliteal Pulses (Manual) | Officer | n | 118 | | 119 | | 108 | | | | — |
| | | Abnormal | 0 | 0.0 | 1 | 0.8 | 1 | 0.9 | | — | — |
| | Enlisted Flyer | n | 54 | | 55 | | 53 | | Overall | | 0.224 ^a |
| | | Abnormal | 2 | 3.7 | 0 | 0.0 | 3 | 5.7 | | — | — |
| | Enlisted Groundcrew | n | 146 | | 149 | | 127 | | Overall | | 0.692 ^a |
| | | Abnormal | 4 | 2.7 | 2 | 1.3 | 3 | 2.4 | M vs. L | 0.48 (0.09, 2.68) | 0.407 |
| | | Normal | 142 | 97.3 | 147 | 98.7 | 124 | 97.6 | H vs. L | 0.86 (0.19, 3.92) | 0.841 |

TABLE M-9. (continued)

Unadjusted Exposure Index Analyses
for Diastolic Blood Pressure, Auscultoscopic Abnormalities,
Carotid Bruits, and Manual Pulse Readings by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|----------------------------------|----------------|-----------|----------------|---------|--------|---------|--------|---------|------------------|-------------------------------|--------------------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Dorsalis Pedis Pulses (Manual) | Officer | n | 118 | | 119 | | 108 | | Overall | | 0.418 |
| | | Abnormal | 15 | 12.7 | 13 | 10.9 | 8 | 7.4 | M vs. L | 0.84 (0.38,1.86) | 0.667 |
| | | Normal | 103 | 87.3 | 106 | 89.1 | 100 | 92.6 | H vs. L | 0.55 (0.22,3.35) | 0.194 |
| | Enlisted Flyer | n | 54 | | 55 | | 53 | | Overall | | 0.716 |
| | | Abnormal | 6 | 11.1 | 9 | 16.4 | 8 | 15.1 | M vs. L | 1.57 (0.52,4.75) | 0.430 |
| | | Normal | 48 | 88.9 | 46 | 83.6 | 45 | 84.9 | H vs. L | 1.42 (0.46,4.42) | 0.542 |
| Enlisted Groundcrew | n | 146 | | 149 | | 127 | | Overall | | 0.555 | |
| | Abnormal | 17 | 11.6 | 12 | 8.0 | 14 | 11.0 | M vs. L | 0.66 (0.31,1.45) | 0.303 | |
| | Normal | 129 | 88.4 | 137 | 92.0 | 113 | 89.0 | H vs. L | 0.94 (0.44,1.99) | 0.841 | |
| Posterior Tibial Pulses (Manual) | Officer | n | 118 | | 119 | | 108 | | | | — |
| | | Abnormal | 1 | 0.8 | 2 | 1.7 | 0 | 0.0 | | | — |
| | | Normal | 117 | 99.2 | 117 | 98.3 | 108 | 100.0 | | | — |
| | Enlisted Flyer | n | 54 | | 55 | | 53 | | Overall | | 0.879 ^a |
| | | Abnormal | 3 | 5.6 | 3 | 5.4 | 4 | 7.6 | M vs. L | 0.98 (0.19,5.09) | 0.984 |
| | | Normal | 51 | 94.4 | 52 | 94.6 | 49 | 92.4 | H vs. L | 1.39 (0.30,6.52) | 0.674 |
| Enlisted Groundcrew | n | 146 | | 149 | | 127 | | Overall | | 0.859 | |
| | Abnormal | 4 | 2.7 | 5 | 3.4 | 5 | 3.9 | M vs. L | 1.23 (0.32,4.68) | 0.757 | |
| | Normal | 142 | 97.3 | 144 | 96.6 | 122 | 96.1 | H vs. L | 1.45 (0.38,5.54) | 0.582 | |

TABLE M-9. (continued)

Unadjusted Exposure Index Analyses
for Diastolic Blood Pressure, Fundoscopic Abnormalities,
Carotid Bruits, and Manual Pulse Readings by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|----------------------------|---------------------|-----------|----------------|---------|--------|---------|--------|---------|----------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| All Leg Pulses (Manual) | Officer | n | 118 | | 119 | | 108 | | Overall | | 0.932 |
| | | Abnormal | 15 | 12.7 | 14 | 11.8 | 12 | 11.1 | M vs. L | 0.92 (0.42, 1.99) | 0.826 |
| | | Normal | 103 | 87.3 | 105 | 88.2 | 96 | 89.0 | H vs. L | 0.86 (0.38, 1.93) | 0.711 |
| | Enlisted Flyer | n | 54 | | 55 | | 53 | | Overall | | 0.848 |
| | | Abnormal | 9 | 16.7 | 11 | 20.0 | 11 | 20.8 | M vs. L | 1.25 (0.47, 3.31) | 0.653 |
| | | Normal | 45 | 83.3 | 44 | 80.0 | 42 | 79.2 | H vs. L | 1.31 (0.49, 3.48) | 0.589 |
| | Enlisted Groundcrew | n | 146 | | 149 | | 127 | | Overall | | 0.659 |
| | | Abnormal | 23 | 15.8 | 18 | 12.1 | 18 | 14.2 | M vs. L | 0.73 (0.38, 1.43) | 0.363 |
| | | Normal | 123 | 84.2 | 131 | 87.9 | 109 | 85.8 | H vs. L | 0.88 (0.45, 1.72) | 0.719 |
| Peripheral Pulses (Manual) | Officer | n | 118 | | 119 | | 108 | | Overall | | 0.904 |
| | | Abnormal | 16 | 13.6 | 14 | 11.8 | 13 | 12.0 | M vs. L | 0.85 (0.39, 1.83) | 0.697 |
| | | Normal | 102 | 86.4 | 105 | 88.2 | 95 | 88.0 | H vs. L | 0.87 (0.40, 1.91) | 0.734 |
| | Enlisted Flyer | n | 54 | | 55 | | 53 | | Overall | | 0.848 |
| | | Abnormal | 9 | 16.7 | 11 | 20.0 | 11 | 20.8 | M vs. L | 1.25 (0.47, 3.31) | 0.653 |
| | | Normal | 45 | 83.3 | 44 | 80.0 | 42 | 79.2 | H vs. L | 1.31 (0.49, 3.48) | 0.589 |
| | Enlisted Groundcrew | n | 146 | | 149 | | 127 | | Overall | | 0.659 |
| | | Abnormal | 23 | 15.8 | 18 | 12.1 | 18 | 14.2 | M vs. L | 0.73 (0.38, 1.43) | 0.363 |
| | | Normal | 123 | 84.2 | 131 | 87.9 | 109 | 85.8 | H vs. L | 0.88 (0.45, 1.72) | 0.719 |

TABLE M-9. (continued)

Unadjusted Exposure Index Analyses
for Diastolic Blood Pressure, Auscultoscopic Abnormalities,
Carotid Bruits, and Manual Pulse Readings by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|---------------------|----------------|-----------|----------------|---------|--------|---------|--------|---------|------------------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| All Pulses (Manual) | Officer | n | 118 | | 119 | | 108 | | | | 0.904 |
| | | Abnormal | 16 | 13.6 | 14 | 11.8 | 13 | 12.0 | M vs. L | 0.85 (0.39,1.83) | 0.697 |
| | | Normal | 102 | 86.4 | 105 | 88.2 | 95 | 88.0 | H vs. L | 0.87 (0.40,1.91) | 0.734 |
| | Enlisted Flyer | n | 54 | | 55 | | 53 | | | | 0.848 |
| | | Abnormal | 9 | 16.7 | 11 | 20.0 | 11 | 20.8 | M vs. L | 1.25 (0.47,3.31) | 0.653 |
| | | Normal | 45 | 83.3 | 44 | 80.0 | 42 | 79.2 | H vs. L | 1.31 (0.49,3.48) | 0.589 |
| Enlisted Groundcrew | n | 146 | | 149 | | 127 | | | | 0.659 | |
| | Abnormal | 23 | 15.8 | 18 | 12.1 | 18 | 14.2 | M vs. L | 0.73 (0.38,1.43) | 0.363 | |
| | Normal | 123 | 84.2 | 131 | 87.9 | 109 | 85.8 | H vs. L | 0.88 (0.45,1.72) | 0.719 | |

*Overall analysis; sparse cells, chi-square test may not be valid.

-- Analysis not performed due to sparse cells.

TABLE M-10.
Unadjusted Exposure Index Analyses for
Peripheral Vascular System Doppler Pulse Readings by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast Risk (95% C.I.) | Est. Relative Risk | p-Value |
|----------------|---------------------|-----------|----------------|---------|--------|---------|--------|---------|--------------------------|--------------------|--------------------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Radial Pulses | Officer | n | 119 | | 122 | | 109 | | | | |
| | | Abnormal | 1 | 0.8 | 0 | 0.0 | 0 | 0.0 | | | |
| | | Normal | 118 | 99.2 | 122 | 100.0 | 109 | 100.0 | | | |
| | | | | | | | | | | | |
| | Enlisted Flyer | n | 54 | | 56 | | 53 | | | | |
| | | Abnormal | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | | | |
| Femoral Pulses | Enlisted Groundcrew | Normal | 54 | 100.0 | 56 | 100.0 | 53 | 100.0 | | | |
| | | | | | | | | | | | |
| | | n | 148 | | 151 | | 130 | | | | |
| | | Abnormal | 1 | 0.7 | 0 | 0.0 | 1 | 0.8 | | | |
| | | Normal | 147 | 99.3 | 151 | 100.0 | 129 | 99.2 | | | |
| | | | | | | | | | | | |
| Femoral Pulses | Officer | n | 119 | | 122 | | 109 | | | | |
| | | Abnormal | 1 | 0.8 | 0 | 0.0 | 0 | 0.0 | | | |
| | | Normal | 118 | 99.2 | 122 | 100.0 | 109 | 100.0 | | | |
| | | | | | | | | | | | |
| | Enlisted Flyer | n | 54 | | 56 | | 53 | | | | |
| | | Abnormal | 0 | 0.0 | 1 | 1.8 | 1 | 1.9 | | | |
| Femoral Pulses | Enlisted Groundcrew | Normal | 54 | 100.0 | 55 | 98.2 | 52 | 98.1 | | | |
| | | | | | | | | | | | |
| | | n | 148 | | 151 | | 130 | | Overall | | 0.304 ^a |
| | | Abnormal | 1 | 0.7 | 0 | 0.0 | 2 | 1.5 | | | |
| | | Normal | 147 | 99.3 | 151 | 100.0 | 128 | 98.5 | | | |
| | | | | | | | | | | | |

TABLE M-10. (continued)

Unadjusted Exposure Index Analyses for
Peripheral Vascular System Doppler Pulse Readings by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|-----------------------------|------------------------|-----------|----------------|---------|--------|---------|--------|---------|----------|-------------------------------|--------------------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Popliteal Pulses | Officer | n | 119 | | 122 | | 109 | | | | |
| | | Abnormal | 1 | 0.8 | 2 | 1.6 | 0 | 0.0 | | | |
| | | Normal | 118 | 99.2 | 120 | 98.4 | 109 | 100.0 | | | |
| | | | | | | | | | | | |
| | Enlisted Flyer | n | 54 | | 56 | | 53 | | | | |
| | | Abnormal | 0 | 0.0 | 2 | 3.6 | 1 | 1.9 | | | |
| Dorsalis Pedis Pulses | | Normal | 54 | 100.0 | 54 | 96.4 | 52 | 98.1 | | | |
| | | | | | | | | | | | |
| | Enlisted Groundcrew | n | 148 | | 151 | | 130 | | Overall | | 0.123 ^a |
| | | Abnormal | 1 | 0.7 | 0 | 0.0 | 3 | 2.3 | | | |
| | | Normal | 147 | 99.3 | 151 | 100.0 | 127 | 97.7 | | | |
| | | | | | | | | | | | |
| | Officer | n | 119 | | 121 | | 109 | | Overall | | 0.967 |
| | | Abnormal | 33 | 27.7 | 35 | 28.9 | 30 | 27.5 | M vs. L | 1.06 (0.60,1.86) | 0.841 |
| | | Normal | 86 | 72.3 | 86 | 71.1 | 79 | 72.5 | H vs. L | 0.99 (0.55,1.77) | 0.968 |
| | | | | | | | | | | | |
| | Enlisted Flyer | n | 54 | | 56 | | 52 | | Overall | | 0.848 |
| | | Abnormal | 11 | 20.4 | 13 | 23.2 | 13 | 25.0 | M vs. L | 1.18 (0.48,2.93) | 0.719 |
| | | Normal | 43 | 79.6 | 43 | 76.8 | 39 | 75.0 | H vs. L | 1.30 (0.52,3.25) | 0.569 |
| | | | | | | | | | | | |
| | Enlisted Groundcrew | n | 147 | | 151 | | 129 | | Overall | | 0.967 |
| | | Abnormal | 32 | 21.8 | 32 | 21.2 | 29 | 22.5 | M vs. L | 0.97 (0.56,1.68) | 0.904 |
| | | Normal | 115 | 78.2 | 119 | 78.8 | 100 | 77.5 | H vs. L | 1.04 (0.59,1.84) | 0.889 |
| | | | | | | | | | | | |

TABLE M-10. (continued)
Unadjusted Exposure Index Analyses for
Peripheral Vascular System Doppler Pulse Readings by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|-------------------------|---------------------|-----------|----------------|---------|--------|---------|--------|---------|----------|-------------------------------|--------------------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Posterior Tibial Pulses | Officer | n | 119 | | 121 | | 109 | | Overall | | 0.410 |
| | | Abnormal | 2 | 1.7 | 5 | 4.1 | 2 | 1.8 | M vs. L | 2.52 (0.48,13.3) | 0.276 |
| | | Normal | 117 | 98.3 | 116 | 95.9 | 107 | 98.2 | H vs. L | 1.09 (0.15,7.90) | 0.928 |
| | | n | 54 | | 56 | | 52 | | Overall | | 0.248 ^a |
| | Enlisted Flyer | Abnormal | 0 | 0.0 | 3 | 5.4 | 2 | 3.8 | | — | — |
| | | Normal | 54 | 100.0 | 53 | 94.6 | 50 | 96.2 | | — | — |
| | Enlisted Groundcrew | n | 147 | | 151 | | 130 | | Overall | | 0.193 ^a |
| | | Abnormal | 2 | 1.4 | 0 | 0.0 | 3 | 2.3 | | — | — |
| | | Normal | 145 | 98.6 | 151 | 100.0 | 127 | 97.7 | | — | — |
| | | | | | | | | | | | |
| Leg Pulses | Officer | n | 119 | | 121 | | 109 | | Overall | | 0.822 |
| | | Abnormal | 33 | 27.7 | 38 | 31.4 | 32 | 29.4 | M vs. L | 1.19 (0.68,2.08) | 0.535 |
| | | Normal | 86 | 72.3 | 83 | 68.6 | 77 | 70.6 | H vs. L | 1.08 (0.61,1.93) | 0.787 |
| | | n | 54 | | 56 | | 52 | | Overall | | 0.666 |
| | Enlisted Flyer | Abnormal | 11 | 20.4 | 15 | 26.8 | 14 | 26.9 | M vs. L | 1.43 (0.58,3.48) | 0.430 |
| | | Normal | 43 | 79.6 | 41 | 73.2 | 38 | 73.1 | H vs. L | 1.44 (0.58,3.55) | 0.430 |
| | Enlisted Groundcrew | n | 147 | | 151 | | 129 | | Overall | | 0.955 |
| | | Abnormal | 33 | 22.4 | 32 | 21.2 | 29 | 22.5 | M vs. L | 0.93 (0.54,1.61) | 0.795 |
| | | Normal | 114 | 77.8 | 119 | 78.8 | 100 | 77.5 | H vs. L | 1.00 (0.57,1.77) | 1.000 |
| | | | | | | | | | | | |

TABLE M-10. (continued)
Unadjusted Exposure Index Analyses for
Peripheral Vascular System Doppler Pulse Readings by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | | | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|-------------------|---------------------|-----------|----------------|---------|--------|---------|--------|---------|----------|-------------------------------|---------|
| | | | Low | | Medium | | High | | | | |
| | | | Number | Percent | Number | Percent | Number | Percent | | | |
| Peripheral Pulses | Officer | n | 119 | | 121 | | 109 | | Overall | | 0.822 |
| | | Abnormal | 33 | 27.7 | 38 | 31.4 | 32 | 29.4 | M vs. L | 1.19 (0.68,2.08) | 0.535 |
| | | Normal | 86 | 72.3 | 83 | 68.6 | 77 | 70.6 | H vs. L | 1.08 (0.61,1.93) | 0.787 |
| | Enlisted Flyer | n | 54 | | 56 | | 52 | | Overall | | 0.666 |
| | | Abnormal | 11 | 20.4 | 15 | 26.8 | 14 | 26.9 | M vs. L | 1.43 (0.58,3.48) | 0.430 |
| | | Normal | 43 | 79.6 | 41 | 73.2 | 38 | 73.1 | H vs. L | 1.44 (0.58,3.55) | 0.430 |
| | Enlisted Groundcrew | n | 147 | | 151 | | 129 | | Overall | | 0.894 |
| | | Abnormal | 34 | 23.1 | 32 | 21.2 | 30 | 23.3 | M vs. L | 0.89 (0.52,1.54) | 0.689 |
| | | Normal | 113 | 76.9 | 119 | 78.8 | 99 | 76.7 | H vs. L | 1.01 (0.58,1.76) | 0.984 |
| | Officer | n | 119 | | 121 | | 109 | | Overall | | 0.822 |
| | | Abnormal | 33 | 27.7 | 38 | 31.4 | 32 | 29.4 | M vs. L | 1.19 (0.68,2.08) | 0.535 |
| | | Normal | 86 | 72.3 | 83 | 68.6 | 77 | 70.6 | H vs. L | 1.08 (0.61,1.93) | 0.787 |
| All Pulses | Enlisted Flyer | n | 54 | | 56 | | 52 | | Overall | | 0.666 |
| | | Abnormal | 11 | 20.4 | 15 | 26.8 | 14 | 26.9 | M vs. L | 1.43 (0.58,3.48) | 0.430 |
| | | Normal | 43 | 79.6 | 41 | 73.2 | 38 | 73.1 | H vs. L | 1.44 (0.58,3.55) | 0.430 |
| | Enlisted Groundcrew | n | 147 | | 151 | | 129 | | Overall | | 0.894 |
| | | Abnormal | 34 | 23.1 | 32 | 21.2 | 30 | 23.3 | M vs. L | 0.89 (0.52,1.54) | 0.689 |
| | | Normal | 113 | 76.9 | 119 | 78.8 | 99 | 76.7 | H vs. L | 1.01 (0.58,1.76) | 0.984 |

*Overall analysis; sparse cells, chi-square test may not be valid.

— Analysis not performed due to sparse cells.

TABLE M-11.

Association Between Central and Peripheral Abnormalities and
Verified Heart Disease in the Combined
Ranch Hand and Comparison Groups

| Variable | Stratification | Total | Essential Hypertension | | p-Value | Heart Disease* | | Myocardial Infarction |
|-----------------------------|----------------|-------|------------------------|------------------|---------|----------------|------------------|-----------------------|
| | | | Percent Abnormal | Percent Abnormal | | p-Value | Percent Abnormal | p-Value |
| Systolic Pressure | ≤140 | 2,002 | 17.5 | 21.7 | <0.001 | 0.556 | 1.0 | 0.386 |
| | >140 | 145 | 61.4 | 24.1 | | | 2.1 | |
| Diastolic Pressure | ≤90 | 1,966 | 14.8 | 22.4 | <0.001 | 0.043 | 1.1 | 0.790 |
| | >90 | 180 | 81.7 | 15.6 | | | 0.6 | |
| ECG | Normal | 1,858 | 18.8 | 17.4 | <0.001 | <0.001 | 0.3 | <0.001 |
| | Abnormal | 290 | 30.7 | 50.3 | | | 5.9 | |
| Heart Sounds | Normal | 2,084 | 20.1 | 21.4 | 0.036 | 0.017 | 0.9 | <0.001 |
| | Abnormal | 63 | 31.8 | 34.9 | | | 6.4 | |
| Fundoscopic Examination | Normal | 2,134 | 20.2 | 21.6 | 0.008 | 0.014 | 1.0 | 0.999 |
| | Abnormal | 13 | 53.8 | 53.8 | | | 0.0 | |
| Carotid Bruits | Normal | 2,132 | 20.3 | 21.8 | 0.080 | 0.775 | 1.0 | 0.999 |
| | Abnormal | 14 | 42.9 | 28.6 | | | 0.0 | |
| Peripheral Pulses (Manual) | Normal | 1,806 | 20.0 | 21.5 | 0.547 | 0.725 | 0.9 | 0.391 |
| | Abnormal | 314 | 21.7 | 22.6 | | | 1.6 | |
| Peripheral Pulses (Doppler) | Normal | 1,611 | 20.6 | 20.4 | 0.754 | 0.007 | 0.9 | 0.306 |
| | Abnormal | 529 | 19.8 | 26.1 | | | 1.5 | |

*Excluding hypertension.

TABLE M-12.

Unadjusted Analyses for Reported and Verified Heart Disease by Group
(Original Comparisons Only)

| Variable | Statistic | Group | | | | Est. Relative Risk (95% C.I.) | p-Value |
|---|-----------|------------|---------|---------------------|---------|-------------------------------|---------|
| | | Ranch Hand | | Original Comparison | | | |
| | | Number | Percent | Number | Percent | | |
| Reported Essential Hypertension | n | 942 | | 888 | | | |
| | Yes | 247 | 26.2 | 231 | 26.0 | 1.01 (0.82, 1.24) | 0.920 |
| | No | 695 | 73.8 | 657 | 74.0 | | |
| Verified Essential Hypertension | n | 942 | | 888 | | | |
| | Yes | 195 | 20.7 | 184 | 20.7 | 1.00 (0.80, 1.25) | 0.992 |
| | No | 747 | 79.3 | 704 | 79.3 | | |
| Reported Heart Disease (Excluding Hypertension) | n | 942 | | 888 | | | |
| | Yes | 265 | 28.1 | 234 | 26.4 | 1.09 (0.89, 1.34) | 0.390 |
| | No | 677 | 71.9 | 654 | 73.6 | | |
| Verified Heart Disease (Excluding Hypertension) | n | 942 | | 888 | | | |
| | Yes | 224 | 23.8 | 180 | 20.3 | 1.23 (0.98, 1.53) | 0.070 |
| | No | 718 | 76.2 | 708 | 79.7 | | |
| Reported Myocardial Infarction | n | 942 | | 888 | | | |
| | Yes | 20 | 2.1 | 18 | 2.0 | 1.05 (0.55, 1.99) | 0.889 |
| | No | 922 | 97.9 | 870 | 98.0 | | |
| Verified Myocardial Infarction | n | 942 | | 888 | | | |
| | Yes | 9 | 1.0 | 11 | 1.2 | 0.77 (0.32, 1.87) | 0.562 |
| | No | 933 | 99.0 | 877 | 98.8 | | |

TABLE M-13.

Adjusted Analyses for Reported and Verified Heart Disease
(Original Comparisons Only)

| Variable | Adj. Relative Risk (95% C.I.) | p-Value | Covariate Remarks* |
|---------------------------------|-------------------------------|---------|--|
| Reported Essential Hypertension | 1.12 (0.90,1.40) | 0.312 | AGE (p<0.001), CSMOK (p<0.001), CHOL (p<0.001), %BFAT (p<0.001), ALC (p=0.003) |
| Verified Essential Hypertension | 1.10 (0.86,1.39) | 0.447 | CSMOK (p=0.015), CHOL (p<0.001), %BFAT (p<0.001), PS (p=0.024), ALC (p=0.028) |
| Reported Heart Disease | 1.14 (0.92,1.40) | 0.230 | AGE (p<0.001), RACE (p=0.046) |
| Verified Heart Disease | 1.28 (1.02,1.60) | 0.032 | AGE (p<0.001) |
| Reported Myocardial Infarction | 1.16 (0.58,2.32) | 0.682 | AGE (p<0.001), OCC (p=0.005), CHOL (p=0.040) |
| Verified Myocardial Infarction | 0.90 (0.36,2.24) | 0.810 | AGE (p<0.001), CHOL (p=0.021) |

*Abbreviations:

CSMOK: Current smoking
 CHOL: Cholesterol
 %BFAT: Percent body fat
 ALC: Current alcohol use (drinks/day)
 PS: Personality score
 OCC: Occupation

Unadjusted Analyses for Central Cardiac Function by Group (Diabetics Excluded) (Original Comparisons Only)

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TABLE M-14. (continued)

Unadjusted Analyses for Central Cardiac Function by Group (Diabetics Excluded)
(Original Comparisons Only)

| Variable | Statistic | Group | | | | Relative Risk (95% C.I.) | p-Value |
|----------------------|-----------|------------|---------|---------------------|---------|--------------------------|---------|
| | | Ranch Hand | | Original Comparison | | | |
| | | Number | Percent | Number | Percent | | |
| ECG: Bradycardia | n | 942 | | 888 | | | |
| | Abnormal | 45 | 4.8 | 38 | 4.3 | | |
| | Normal | 897 | 95.2 | 850 | 95.7 | 1.12 (0.72, 1.75) | 0.610 |
| ECG: Tachycardia | n | 942 | | 888 | | | |
| | Abnormal | 0 | 0.0 | 0 | 0.0 | | |
| | Normal | 942 | 100.0 | 888 | 100.0 | -- | -- |
| ECG: Arrhythmia | n | 942 | | 888 | | | |
| | Abnormal | 31 | 3.3 | 32 | 3.6 | | |
| | Normal | 911 | 96.7 | 856 | 96.4 | 0.91 (0.55, 1.50) | 0.711 |
| ECG: Other Diagnoses | n | 942 | | 888 | | | |
| | Abnormal | 97 | 10.3 | 92 | 10.4 | | |
| | Normal | 845 | 89.7 | 796 | 89.6 | 0.99 (0.74, 1.34) | 0.968 |

--No relative risk given, since no abnormalities are present.

TABLE M-15.

Adjusted Analyses for Central Cardiac Function (Diabetics Excluded)*
(Original Comparisons Only)

| Variable | Adj. Relative Risk (95% C.I.) | p-Value | Covariate Remarks** |
|---|----------------------------------|---------|--|
| Systolic Blood Pressure (Discrete) | 0.95 (0.65,1.38) | 0.772 | AGE (p<0.001) CHOL (p=0.001) %BFAT (p<0.001) PS (p=0.001) |
| Systolic Blood Pressure (Continuous) | -0.152 (-1.401,1.097)* | 0.811* | AGE*OCC (p=0.018) CSMOK (p<0.001) CHOL (p<0.001) %BFAT (p<0.001) PS (p=0.001) ALC (p<0.001) |
| Heart Sounds | 1.26 (0.73,2.17) | 0.407 | AGE (p<0.001) RACE (p=0.002) OCC (p=0.048) CHOL/HDL (p<0.001) |
| ECG (Overall) | **** | **** | AGE (p<0.001) RACE (p=0.023) %BFAT (p<0.001) GRP*PACKYR (p=0.034) |
| ECG: RBBB | 0.85 (0.26,2.81) | 0.787 | AGE (p=0.015) |
| ECG: Nonspecific ST-T-Wave Changes | 1.20 (0.85,1.69) | 0.294 | AGE (p<0.001) RACE (p=0.033) CHOL (p=0.009) %BFAT (p<0.001) |
| ECG: Bradycardia | 1.16 (0.74,1.82) | 0.509 | OCC (p=0.019) CHOL/HDL (p<0.001) |

TABLE M-15. (continued)

Adjusted Analyses for Central Cardiac Function (Diabetics Excluded)*
(Original Comparisons Only)

| Variable | Adj. Relative Risk (95% C.I.) | p-Value | Covariate Remarks** |
|----------------------|----------------------------------|---------|---|
| ECG: Arrhythmia | **** | **** | AGE (p<0.001) OCC (p<0.001) GRP*PACKYR (p=0.034) GRP*%BFAT (p=0.016) |
| ECG: Other Diagnoses | **** | **** | AGE (p<0.001) GRP*OCC (p=0.036) |

*Some adjusted analyses did not explore effects of all covariates due to sparse number of abnormalities (see text).

**Additional Abbreviations:

CHOL/HDL: cholesterol to HDL ratio

GRP: group

PACKYR: pack-years of smoking

****Group-by-covariate interaction--relative risk/difference in group means, 95% confidence interval, and p-value not presented.

^aDifference in group means (Ranch Hand-Original Comparison) and associated p-value given, rather than relative risk, for continuous analysis of dependent variables.

TABLE M-16.

Summary of Group-by-Covariate Interactions
for Central Cardiac Function Variables (Diabetics Excluded)
(Original Comparisons Only)

| Variable | Interaction | Stratification | Adj. Relative Risk (95% C.I.) | p-Value |
|----------------------|--|---------------------|-------------------------------|---------|
| ECG (Overall) | Group-by-Pack-Years Smoking | Pack-Years: 0 | 0.76 (0.53, 1.10) | 0.142 |
| | | Pack-Years: 30 | 1.24 (0.87, 1.78) | 0.234 |
| ECG: Arrhythmia | Group-by-Pack-Years Smoking (21% Body Fat) | Pack-Years: 0 | 0.59 (0.30, 1.18) | 0.134 |
| | | Pack-Years: 30 | 1.55 (0.72, 3.33) | 0.263 |
| | Group-by-Percent Body Fat (7 Pack-Years Smoking) | 10% Body Fat | 0.17 (0.05, 0.62) | 0.007 |
| | | 30% Body Fat | 2.46 (0.76, 7.99) | 0.136 |
| ECG: Other Diagnoses | Group-by-Occupation | Officer | 1.73 (1.06, 2.85) | 0.030 |
| | | Enlisted Flyer | 0.75 (0.38, 1.47) | 0.401 |
| | | Enlisted Groundcrew | 0.73 (0.44, 1.22) | 0.234 |

TABLE M-17.

Unadjusted Analyses for Peripheral Vascular Function by Group
(Diabetics Excluded)
(Original Comparisons Only)

| Variable | Statistic | Group | | | Est. Relative Risk (95% C.I.) | p-Value |
|--------------------------|-----------|------------|---------|---------------------|-------------------------------|---------|
| | | Ranch Hand | | Original Comparison | | |
| | | Number | Percent | Number | Percent | |
| Diastolic Blood Pressure | n | 942 | | 887 | | |
| | Abnormal | 79 | 8.4 | 76 | 8.6 | 0.889 |
| | Normal | 863 | 91.6 | 811 | 91.4 | |
| Funduscopy Examination | n | 941 | | 888 | | |
| | Abnormal | 7 | 0.7 | 6 | 0.7 | 0.865 |
| | Normal | 934 | 99.3 | 882 | 99.3 | |
| Carotid Bruits | n | 941 | | 887 | | |
| | Abnormal | 7 | 0.7 | 6 | 0.7 | 0.865 |
| | Normal | 934 | 99.3 | 881 | 99.3 | |
| Radial Pulses (Manual) | n | 929 | | 876 | | |
| | Abnormal | 4 | 0.4 | 7 | 0.8 | 0.322 |
| | Normal | 925 | 99.6 | 869 | 99.2 | |
| Radial Pulses (Doppler) | n | 942 | | 886 | | |
| | Abnormal | 3 | 0.3 | 4 | 0.4 | 0.646 |
| | Normal | 939 | 99.7 | 882 | 99.6 | |
| Femoral Pulses (Manual) | n | 929 | | 876 | | |
| | Abnormal | 20 | 2.2 | 21 | 2.4 | 0.726 |
| | Normal | 909 | 97.8 | 855 | 97.6 | |

TABLE M-17. (continued)

Unadjusted Analyses for Peripheral Vascular Function by Group
(Diabetics Excluded)
(Original Comparisons Only)

| Variable | Statistic | Group | | Est. Relative Risk (95% C.I.) | p-Value |
|-----------------------------------|-------------------------|-------------------|---------------------|-------------------------------|--------------|
| | | Ranch Hand | Original Comparison | | |
| | | Number | Percent | Number | Percent |
| Femoral Pulses (Doppler) | n Abnormal Normal | 942 6 936 | 0.6 99.4 | 887 3 884 | 0.3 99.7 |
| | | | | 1.89 (0.47, 7.57) | 0.368 |
| Popliteal Pulses (Manual) | n Abnormal Normal | 929 16 913 | 1.7 98.3 | 876 21 855 | 2.4 97.6 |
| | | | | 0.71 (0.37, 1.38) | 0.312 |
| Popliteal Pulses (Doppler) | n Abnormal Normal | 942 10 932 | 1.1 98.9 | 887 6 881 | 0.7 99.3 |
| | | | | 1.58 (0.57, 4.35) | 0.379 |
| Dorsalis Pedis Pulses (Manual) | n Abnormal Normal | 929 102 827 | 11.0 89.0 | 876 95 781 | 10.8 89.2 |
| | | | | 1.01 (0.71, 1.45) | 0.928 |
| Dorsalis Pedis Pulses (Doppler) | n Abnormal Normal | 938 228 710 | 24.3 75.7 | 885 203 682 | 22.9 77.1 |
| | | | | 1.08 (0.87, 1.34) | 0.490 |
| Posterior Tibial Pulses (Manual) | n Abnormal Normal | 929 27 902 | 2.9 97.1 | 876 24 852 | 2.7 97.3 |
| | | | | 1.06 (0.61, 1.85) | 0.834 |
| Posterior Tibial Pulses (Doppler) | n Abnormal Normal | 939 19 920 | 2.0 98.0 | 885 18 867 | 2.0 98.0 |
| | | | | 0.99 (0.52, 1.91) | 0.984 |

TABLE M-17. (continued)

Unadjusted Analyses for Peripheral Vascular Function by Group
(Diabetics Excluded)
(Original Comparisons Only)

| Variable | Statistic | Group | | Est. Relative Risk (95% C I.) | p-Value |
|-----------------------------|-----------|------------|---------------------|-------------------------------|---------|
| | | Ranch Hand | Original Comparison | | |
| | | Number | Percent | Number | Percent |
| Leg Pulses (Manual) | n | 929 | | 876 | |
| | Abnormal | 131 | 14.1 | 134 | 15.3 |
| | Normal | 798 | 85.9 | 742 | 84.7 |
| Leg Pulses (Doppler) | n | 938 | | 885 | |
| | Abnormal | 237 | 25.3 | 212 | 23.9 |
| | Normal | 701 | 74.7 | 673 | 76.1 |
| Peripheral Pulses (Manual) | n | 929 | | 876 | |
| | Abnormal | 133 | 14.3 | 138 | 15.8 |
| | Normal | 796 | 85.7 | 738 | 84.2 |
| Peripheral Pulses (Doppler) | n | 938 | | 885 | |
| | Abnormal | 239 | 25.5 | 214 | 24.2 |
| | Normal | 699 | 74.5 | 671 | 75.8 |
| All Pulses (Manual) | n | 929 | | 876 | |
| | Abnormal | 133 | 14.3 | 138 | 15.8 |
| | Normal | 796 | 85.7 | 738 | 84.2 |
| All Pulses (Doppler) | n | 938 | | 884 | |
| | Abnormal | 239 | 25.5 | 214 | 24.2 |
| | Normal | 699 | 74.5 | 670 | 75.8 |

TABLE M-18.

Adjusted Analyses for Peripheral Vascular Function
(Diabetics Excluded)*
(Original Comparisons Only)

| Variable | Statistical/Clinical Analysis | Adj. Relative Risk (95% C.I.) | p-Value | Covariate Remarks** |
|--------------------------|-------------------------------|-----------------------------------|--------------------|--|
| Diastolic Blood Pressure | Discrete | 1.04 (0.74,1.46) | 0.818 | CHOL (p<0.001) %BFAT (p<0.001) |
| | Continuous | 0.250 (-0.530,1.030) ^a | 0.537 ^a | AGE (p=0.016) CSMOK (p<0.001) CHOL (p<0.001) %BFAT (p<0.001) ALC (p=0.004) |
| Funduscopy Examination | | 1.31 (0.42,4.09) | 0.646 | AGE (p<0.001) RACE (p<0.001) CHOL/HDL (p=0.010) ALC (p=0.032) |
| Carotid Bruits | | 0.95 (0.30,2.97) | 0.928 | AGE (p=0.018) DRKCR (p<0.001) |
| Radial Pulses | Manual | 0.57 (0.17,1.96) | 0.373 | AGE (p=0.047) |
| | Doppler | 0.70 (0.16,3.16) ^b | 0.646 ^b | — |
| Femoral Pulses | Manual | 1.20 (0.60,2.36) | 0.710 | AGE (p<0.001) OCC (p=0.050) CHOL/HDL (p=0.043) %BFAT (p<0.001) DIFCORT (p=0.005) |
| | Doppler | 1.87 (0.45,7.74) | 0.384 | AGE (p=0.001) CSMOK (p=0.001) CHOL/HDL (p=0.032) |
| Popliteal Pulses | Manual | **** | **** | AGE (p=0.002) RACE (p=0.002) PACKCR (p=0.006) CHOL/HDL (p=0.021) GRP*OCC (p=0.048) |
| | Doppler | 1.66 (0.59,4.72) | 0.337 | AGE (p<0.001) RACE (p=0.015) CSMOK (p<0.001) |
| Dorsalis Pedis Pulses | Manual | 1.06 (0.78,1.44) | 0.704 | AGE (p=0.004) |
| | Doppler | 1.07 (0.86,1.33) | 0.569 | AGE (p=0.036) RACE (p=0.007) %BFAT (p=0.010) |

TABLE M-18. (continued)

Adjusted Analyses for Peripheral Vascular Function
(Diabetics Excluded)*
(Original Comparisons Only)

| Variable | Statistical/Clinical Analysis | Adj. Relative Risk (95% C.I.) | p-Value | Covariate Remarks** |
|-------------------------|-------------------------------|-------------------------------|---------|--|
| Posterior Tibial Pulses | Manual | **** | **** | AGE (p=0.003) RACE (p<0.001) PACKYR (p=0.011) GRP*OOC (p=0.026) |
| | Doppler | 1.07 (0.54,2.13) | 0.849 | AGE (p<0.001) RACE (p<0.001) CSMOK (p=0.010) CHOL/HDL (p=0.002) |
| Leg Pulses | Manual | **** | **** | AGE (p=0.001) GRP*OOC (p=0.038) GRP*%BFAT (p=0.010) |
| | Doppler | 1.07 (0.86,1.33) | 0.516 | AGE (p=0.016) RACE (p=0.024) %BFAT (p=0.034) |
| Peripheral Pulses | Manual | **** | **** | AGE (p<0.001) GRP*%BFAT (p=0.036) |
| | Doppler | 1.06 (0.86,1.32) | 0.575 | AGE (p=0.028) RACE (p=0.042) %BFAT (p=0.033) |
| All Pulses | Manual | **** | **** | AGE (p<0.001) GRP*%BFAT (p=0.036) |
| | Doppler | 1.06 (0.86,1.32) | 0.582 | AGE (p=0.027) RACE (p=0.042) %BFAT (p=0.038) |

*Some adjusted analyses did not explore effects of all covariates due to sparse number of abnormalities (see text).

**Additional Abbreviations:

DRKYR: Drink-years of alcohol
DIFCORT: Differential cortisol

^aDifference in group means (Ranch Hand - Original Comparison) and associated p-value given, rather than relative risk, continuous analysis of dependent variables.

^bUnadjusted for any covariates—same as for unadjusted results.

—No covariates significant.

****Group-by-covariate interaction—relative risk, 95% confidence interval, and p-value not presented.

TABLE M-19.

Summary of Group-by-Covariate Interactions
for Peripheral Vascular Function Variables (Diabetics Excluded)
(Original Comparisons Only)

| Variable | Interaction | Stratification | Adj. Relative Risk (95% C.I.) | p Value |
|-------------------------------------|---------------------------------------|---------------------|----------------------------------|---------|
| Popliteal Pulses (Manual) | Group-by-Occupation | Officer | 0.21 (0.02, 2.54) | 0.219 |
| | | Enlisted Flyer | 4.68 (0.53, 41.1) | 0.165 |
| | | Enlisted Groundcrew | 0.99 (0.38, 2.55) | 0.976 |
| Posterior Tibial Pulses (Manual) | Group-by-Occupation | Officer | 0.31 (0.05, 1.82) | 0.197 |
| | | Enlisted Flyer | 3.68 (0.96, 14.1) | 0.057 |
| | | Enlisted Groundcrew | 1.27 (0.56, 2.87) | 0.575 |
| Leg Pulses (Manual) | Group-by-Occupation (21% Body Fat) | Officer | 0.65 (0.41, 1.01) | 0.054 |
| | | Enlisted Flyer | 1.52 (0.83, 2.77) | 0.174 |
| | | Enlisted Groundcrew | 1.23 (0.81, 1.87) | 0.327 |
| Peripheral Pulses (Manual) | Group-by-Percent Body Fat | 10% Body Fat | 1.87 (0.94, 3.72) | 0.073 |
| | | 30% Body Fat | 0.58 (0.34, 0.98) | 0.042 |
| All Pulses (Manual) | Group-by-Percent Body Fat | 10% Body Fat | 1.87 (0.94, 3.72) | 0.073 |
| | | 30% Body Fat | 0.58 (0.34, 0.98) | 0.042 |

TABLE M-20.

Longitudinal Analysis of Pulse Index and Overall ECG:
A Contrast of Baseline and First Followup Examination Abnormalities
(Original Comparisons Only)

| Variable | Group | 1982 | 1985 | | Odds* Ratio (OR) | p-Value (OR _{RH} vs OR _{OC}) |
|------------------------|------------------------|------------------|------------------|---------------|------------------------|--|
| | | Baseline Exam | Followup Exam | | | |
| | | | <u>Abnormal</u> | <u>Normal</u> | | |
| All Pulses (Manual) | Ranch Hand | Abnormal | 50 | 72 | 1.44 | 0.05 |
| | | Normal | 104 | 743 | | |
| | Original Comparison | Abnormal | 35 | 51 | 2.25 | |
| | | Normal | 115 | 668 | | |
| ECG (Overall) | Ranch Hand | Abnormal | 86 | 192 | 0.22 | 0.23 |
| | | Normal | 43 | 650 | | |
| | Original Comparison | Abnormal | 83 | 147 | 0.30 | |
| | | Normal | 44 | 598 | | |

*Odds Ratio:
$$\frac{\text{Number Normal Baseline, Abnormal Followup}}{\text{Number Abnormal Baseline, Normal Followup}}$$

APPENDIX N
Hematological Evaluation

APPENDIX N: Hematological Evaluation

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TABLE N-1.

Summary Statistics for Hematological Covariates by Group

| Covariate | Covariate Category | Group | | p-Value |
|------------------------------|---------------------|--------------------|--------------------|---------|
| | | Ranch Hand Percent | Comparison Percent | |
| Race | Black | 5.9 | 6.4 | 0.679 |
| | Nonblack | 94.1 | 93.6 | |
| Occupation | Officer | 37.4 | 37.5 | 0.724 |
| | Enlisted Flyer | 17.5 | 16.2 | |
| | Enlisted Groundcrew | 45.2 | 46.3 | |
| | | <u>Mean±SE</u> | <u>Mean±SE</u> | |
| Age (At Baseline) | -- | 43.94±0.24 | 43.86±0.22 | 0.804 |
| Current Smoking ^a | -- | 10.75±0.48 | 9.13±0.40 | 0.010 |
| Smoking History (Pack-Years) | -- | 13.24±0.52 | 12.98±0.47 | 0.708 |

^aEquivalent cigarettes per day.

--Covariate not categorized for these results.

TABLE N 2.

Summary of Group by Covariate
Interactions for Hematological Variables

| Variable | Interaction Covariates | Stratification | Ranch Hand-Comparison Group Difference \pm SE | p Value | Direction of Result* |
|----------|------------------------|----------------|--|---------|-------------------------|
| RBC | Occupation | Officer | | | |
| | | Non-smoker | -0.009 \pm 0.030 | 0.775 | |
| | Smoking History | 30 Pack-Years | -0.014 \pm 0.035 | 0.686 | |
| | | Enlisted Flyer | | | |
| | | Non-smoker | -0.066 \pm 0.053 | 0.212 | |
| | | 30 Pack-Years | -0.001 \pm 0.046 | 0.975 | |
| | Enlisted Groundcrew | Non-smoker | -0.010 \pm 0.029 | 0.736 | |
| | | 30 Pack-Years | -0.093 \pm 0.036 | 0.010 | C>RH |
| | Race | Nonblack | | | |
| | | Non-smoker | -0.010 \pm 0.020 | 0.609 | |
| WBC* | Smoking History | 35 | 0.002 \pm 0.021 | 0.942 | |
| | | 53 | | | |
| | Occupation | 30 Pack-Years | | | |
| | | 35 | 0.115 \pm 0.031 | <0.001 | RH>C |
| | | 53 | -0.017 \pm 0.019 | 0.369 | |
| | Age (At Baseline) | Black | | | |
| | | Officer | | | |
| | | 35 | -0.550 \pm 0.184 | 0.003 | C>RH |
| | | 53 | -0.143 \pm 0.186 | 0.446 | |
| | Enlisted Flyer | 35 | -0.341 \pm 0.172 | 0.050 | C>RH |
| | | 53 | 0.067 \pm 0.134 | 0.618 | |
| | Enlisted Groundcrew | 35 | -0.121 \pm 0.074 | 0.104 | |
| | | 53 | 0.286 \pm 0.149 | 0.057 | RH>C |

TABLE N-2. (continued)
Summary of Group-by-Covariate
Interactions for Hematological Variables

| Variable | Interaction Covariates | Stratification | Ranch Hand-Comparison Group Difference \pm SE | p-Value | Direction of Result* |
|------------------|------------------------|----------------------|--|---------|-------------------------|
| PLT ^a | Race | Nonblack | | | |
| | | Nonsmoker | | | |
| | Smoking | 30 Pack-Years, | 0.003 \pm 0.012 | 0.789 | |
| | (Smoking History | Currently 1 Pack/Day | 0.103 \pm 0.042 | 0.014 | RH>C |
| | and Current Smoking) | | | | |
| | | Black | | | |
| | | Nonsmoker | -0.050 \pm 0.050 | 0.317 | |
| | | 30 Pack-Years, | | | |
| | | Currently 1 Pack/Day | 0.258 \pm 0.096 | 0.007 | RH>C |

*RH>C: Variable mean in Ranch Hand group greater than variable mean in Comparison group.
C>RH: Variable mean in Comparison group greater than variable mean in Ranch Hand group.

^aUnits are on log scale.

TABLE N-3.

Interaction Summaries for Adjusted Continuous Exposure
Index Analyses for Hematological Variables

| Variable | Interaction (Occupation) | Stratification | Contrast | Exposure Index Level Difference \pm SE | p-Value | Direction of Result* |
|----------|---|----------------|----------|---|---------|-------------------------|
| RBC | Exposure Index- by-Race (Officer) | Nonblack | M vs. L | 0.014 \pm 0.295 | 0.962 | |
| | | | H vs. L | -0.180 \pm 0.372 | 0.630 | |
| | | Black | M vs. L | -0.047 \pm 0.402 | 0.908 | |
| | | | H vs. L | 0.516 \pm 0.502 | 0.304 | |
| RBC | Exposure Index- by-Age (At Baseline) (Enlisted Flyer) | 35 | M vs. L | -0.119 \pm 0.128 | 0.356 | |
| | | | H vs. L | 0.261 \pm 0.151 | 0.086 | H > L |
| | | 53 | M vs. L | 0.033 \pm 0.102 | 0.748 | |
| | | | H vs. L | -0.172 \pm 0.102 | 0.093 | L > H |
| HGB | Exposure Index- by-Race (Officer) | Nonblack | M vs. L | -0.007 \pm 0.122 | 0.955 | |
| | | | H vs. L | 0.060 \pm 0.123 | 0.626 | |
| | | Black | M vs. L | 0.089 \pm 0.874 | 0.919 | |
| | | | H vs. L | 2.227 \pm 0.960 | 0.021 | H > L |
| HGB | Exposure Index- by-Age (At Baseline) (Enlisted Flyer) | 35 | M vs. L | -0.854 \pm 0.389 | 0.029 | |
| | | | H vs. L | 0.626 \pm 0.457 | 0.172 | L > M |
| | | 53 | M vs. L | 0.425 \pm 0.308 | 0.169 | |
| | | | H vs. L | -0.339 \pm 0.308 | 0.272 | |
| HCT | Exposure Index- by-Race (Officer) | Nonblack | M vs. L | -0.093 \pm 0.359 | 0.795 | |
| | | | H vs. L | 0.206 \pm 0.362 | 0.569 | |
| | | Black | M vs. L | -0.849 \pm 2.569 | 0.741 | |
| | | | H vs. L | 5.611 \pm 2.823 | 0.048 | H > L |

TABLE N-3. (continued)
Interaction Summaries for Adjusted Continuous Exposure
Index Analyses for Hematological Variables

| Variable | Interaction (Occupation) | Stratification | Contrast | Exposure Index Level Difference \pm SE | p-Value | Direction of Result* |
|----------|---|----------------|----------|---|---------|-------------------------|
| HCT | Exposure Index by-Age (At Baseline) (Enlisted Flyer) | 35 | M vs. L | -2.332 \pm 1.141 | 0.042 | L > M |
| | | | H vs. L | 1.921 \pm 1.341 | 0.154 | |
| | | 53 | M vs. L | 1.074 \pm 0.904 | 0.236 | L > M |
| | | | H vs. L | -0.887 \pm 0.904 | 0.328 | |
| PLT* | Exposure Index - by-Current Smoking (Packs per Day) (Enlisted Flyer) | 0 | M vs. L | 0.097 \pm 0.054 | 0.075 | M > L |
| | | | H vs. L | -0.005 \pm 0.053 | 0.932 | |
| | | 1 | M vs. L | -0.015 \pm 0.042 | 0.710 | L > M |
| | | | H vs. L | -0.062 \pm 0.045 | 0.169 | |
| | | 2 | M vs. L | -0.128 \pm 0.068 | 0.064 | L > M |
| | | | H vs. L | -0.118 \pm 0.078 | 0.132 | |
| PLT* | Exposure Index - by-Race (Enlisted Groundcrew) | Nonblack | M vs. L | -0.015 \pm 0.025 | 0.557 | M > L |
| | | | H vs. L | -0.004 \pm 0.026 | 0.885 | |
| | | Black | M vs. L | 0.156 \pm 0.079 | 0.049 | M > L |
| | | | H vs. L | -0.036 \pm 0.081 | 0.659 | |

*H > L: Variable mean in high exposure index category greater than variable mean in low exposure index category.
L > H: Variable mean in low exposure index category greater than variable mean in high exposure index category.
L > M: Variable mean in low exposure index category greater than variable mean in medium exposure index category.
M > L: Variable mean in medium exposure index category greater than variable mean in low exposure index category.
*Units are in log scale.

TABLE N-4.

Unadjusted Categorical Analyses for
Hematological Variables by Group
(Original Comparisons Only)

| Variable | Group | <u>Abnormally Low</u> | | <u>Normal</u> | | <u>Abnormally High</u> | | Total | p-Value ^a |
|----------|---------------------|-----------------------|---------|---------------|---------|------------------------|---------|-------|----------------------|
| | | Number | Percent | Number | Percent | Number | Percent | | |
| RBC | Ranch Hand | 30 | 3.0 | 976 | 96.2 | 8 | 0.8 | 1,014 | 0.598 |
| | Original Comparison | 36 | 3.8 | 910 | 95.4 | 8 | 0.8 | 954 | |
| WBC | Ranch Hand | 45 | 4.4 | 906 | 89.4 | 62 | 6.1 | 1,013 | 0.631 |
| | Original Comparison | 47 | 4.9 | 857 | 89.8 | 50 | 5.2 | 954 | |
| HGB | Ranch Hand | 39 | 3.8 | 752 | 74.2 | 223 | 22.0 | 1,014 | 0.867 |
| | Original Comparison | 34 | 3.6 | 717 | 75.2 | 203 | 21.3 | 954 | |
| HCT | Ranch Hand | 11 | 1.1 | 1,001 | 98.7 | 2 | 0.2 | 1,014 | 0.722 |
| | Original Comparison | 13 | 1.4 | 938 | 98.3 | 3 | 0.3 | 954 | |
| MCV | Ranch Hand | 10 | 1.0 | 857 | 84.5 | 147 | 14.5 | 1,014 | 0.904 |
| | Original Comparison | 11 | 1.2 | 809 | 84.8 | 134 | 14.0 | 954 | |
| MCH | Ranch Hand | 7 | 0.7 | 943 | 93.0 | 64 | 6.3 | 1,014 | 0.947 |
| | Original Comparison | 7 | 0.7 | 890 | 93.3 | 57 | 6.0 | 954 | |
| MCHC | Ranch Hand | 1 | 0.1 | 1,013 | 99.9 | 0 | 0.0 | 1,014 | — |
| | Original Comparison | 0 | 0.0 | 954 | 100.0 | 0 | 0.0 | 954 | |
| PLT | Ranch Hand | 5 | 0.5 | 987 | 97.4 | 21 | 2.1 | 1,013 | 0.760 |
| | Original Comparison | 2 | 0.2 | 935 | 98.0 | 17 | 1.8 | 954 | |

^aChi-square test, 2 d.f., except for HCT and PLT, which were obtained from continuity adjusted chi-square tests on 1 d.f. (Abnormally high category pooled with normal, and abnormally low category pooled with normal for HCT and PLT, respectively.)

—Only one abnormal MCHC value; p-value not given.

TABLE N-5.

Unadjusted Continuous Analyses for
Hematological Variables (Contrast of Group Means)
(Original Comparisons Only)

| Variable | Group Mean \pm SE | | Difference \pm SE | t-Statistic | p-Value |
|------------------|---------------------|------------------------|------------------------|-------------|---------|
| | Ranch Hand | Original Comparison | | | |
| RBC | 4.964 \pm 0.012 | 4.974 \pm 0.012 | -0.010 \pm 0.017 | -0.61 | 0.540 |
| WBC ¹ | 7.003 | 6.844 | -- | 1.78 | 0.076 |
| HGB | 15.624 \pm 0.033 | 15.600 \pm 0.034 | 0.024 \pm 0.047 | 0.50 | 0.619 |
| HCT | 45.904 \pm 0.097 | 45.874 \pm 0.097 | 0.030 \pm 0.137 | 0.22 | 0.827 |
| MCV | 92.596 \pm 0.150 | 92.355 \pm 0.157 | 0.241 \pm 0.217 | 1.11 | 0.268 |
| MCH | 31.544 \pm 0.055 | 31.435 \pm 0.058 | 0.108 \pm 0.080 | 1.35 | 0.177 |
| MCHC | 34.040 \pm 0.021 | 34.009 \pm 0.613 | 0.030 \pm 0.029 | 1.06 | 0.291 |
| PLT ¹ | 265.2 | 261.7 | -- | 1.39 | 0.165 |

¹Means transformed from log scale.

--Difference and standard errors (SE) not presented, since variables were analyzed on logarithmic scale.

TABLE N-6.

Adjusted Categorical Analyses for Hematological Variables
(Abnormal Versus Normal, Adjusted for Age, Race, Occupation, and Smoking)
(Original Comparisons Only)

| Variable | <u>Abnormally Low vs. Normal</u> | | <u>Abnormally High vs. Normal</u> | |
|----------|----------------------------------|--------------------|-----------------------------------|--------------------|
| | Adj. Relative Risk (95% C.I.) | p-Value | Adj. Relative Risk (95% C.I.) | p-Value |
| RBC | 0.81 (0.51,1.30) | 0.380 | 0.95 (0.41,2.17) | 0.898 |
| WBC | 0.95 (0.63,1.43) | 0.730 | 1.16 (0.80,1.70) | 0.431 |
| HGB | 1.10 (0.70,1.72) | 0.692 | 1.05 (0.85,1.30) | 0.662 |
| HCT | 0.84 (0.41,1.71) ^a | 0.628 ^a | Sparse Data | |
| MCV | | | | |
| Nonblack | 1.92 (0.64,5.76) | 0.242 | 1.09 (0.84,1.42) | 0.503 |
| Black | 0.32 (0.09,1.11) | 0.072 | 0.41 (0.12,1.34) | 0.139 |
| MCH | 0.96 (0.40,2.30) | 0.920 | 1.06 (0.74,1.52) | 0.734 |
| PLT | Sparse Data | | 1.13 (0.63,2.05) ^b | 0.682 ^b |

^aAbnormally low versus normal/abnormally high.

^bAbnormally high versus normal/abnormally low.

TABLE N-7.

Adjusted Continuous Analyses for Hematological Variables
 (Ranch Hand-Original Comparison Group Differences)
 (Original Comparisons Only)

| Variable | Ranch Hand-Original Comparison Group Difference ±SE | p-Value | Covariate Remarks* |
|----------|---|---------|---|
| RBC | -0.018 ± 0.017 | 0.278 | AGE (p<0.001) CSMOK (p=0.001) OCC*PACKYR (p=0.043) |
| WBC | **** | **** | GRP*RACE*OCC (p<0.001) GRP*AGE*RACE (p=0.013) GRP*AGE*PACKYR (p=0.013) GRP*RACE*PACKYR (p=0.022) PACKYR*CSMOK (p<0.001) |
| HGB | **** | **** | GRP*RACE*AGE (p=0.030) GRP*RACE*OCC (p=0.020) OCC*PACKYR (p=0.023) CSMOK (p<0.001) |
| HCT | **** | **** | GRP*RACE*AGE (p=0.026) GRP*RACE*OCC (p=0.011) AGE*OCC (p=0.009) CSMOK (p<0.001) |
| MCV | **** | **** | GRP*AGE*PACKYR (p=0.041) GRP*AGE*CSMOK (p=0.012) RACE*OCC (p=0.021) AGE*RACE (p<0.001) |
| MCH | **** | **** | GRP*AGE*CSMOK (p=0.026) AGE*RACE (p=0.001) OCC (p=0.001) |
| MCHC | 0.030 ± 0.028 | 0.296 | RACE (p<0.001) |
| PLT | **** | **** | GRP*RACE*PACKYR (p=0.011) GRP*AGE (p=0.040) OCC (p=0.005) |

*CSMOK: current level of smoking (cigarettes per day)

PACKYR: smoking history (pack years)

OCC: occupation

GRP: group

****Group-by-covariate interaction--group difference, standard error (SE), and p-value not presented.

TABLE N-8.

Summary of Group-by-Covariate
Interactions for Hematological Variables
(Original Comparisons Only)

| Variable | Interaction Covariates | Stratification | Ranch Hand-Original Comparison Group Difference \pm SE | p-Value | Direction of Result* |
|------------------|------------------------|--|---|---------|-------------------------|
| WBC ^a | Race | Nonblack Nonsmoker | | | |
| | | 35 | | | |
| | Smoking History | 53 | -0.014 \pm 0.021 | 0.511 | |
| | | | 0.014 \pm 0.022 | 0.508 | |
| | Age (At Baseline) | | | | |
| | | 30 Pack-Years | | | |
| | | 35 | 0.107 \pm 0.033 | 0.001 | RH>OC |
| | | 53 | -0.011 \pm 0.019 | 0.551 | |
| | | Black (No significant interactions) | -0.053 \pm 0.058 | 0.364 | |

TABLE N-8. (continued)

Summary of Group-by-Covariate
Interactions for Hematological Variables
(Original Comparisons Only)

| Variable | Interaction Covariates | Stratification | Ranch Hand-Original Comparison Group Difference \pm SE | p-Value | Direction of Result* |
|----------|------------------------|----------------------------|---|---------|-------------------------|
| HGB | Race | Nonblack <u>Officer</u> | | | |
| | Occupation | 35 | 0.151 \pm 0.113 | 0.181 | |
| | | 53 | -0.035 \pm 0.082 | 0.667 | |
| | Age (At Baseline) | Enlisted Flyer | | | |
| | | 35 | 0.087 \pm 0.132 | 0.509 | |
| | | 53 | -0.100 \pm 0.121 | 0.410 | |
| | | Enlisted Groundcrew | | | |
| | | 35 | 0.026 \pm 0.080 | 0.744 | |
| | | 53 | -0.161 \pm 0.107 | 0.134 | |
| | | Black | | | |
| | | <u>Officer</u> | | | |
| | | 35 | -1.034 \pm 0.627 | 0.099 | OC>RH |
| | | 53 | 0.209 \pm 0.629 | 0.740 | |
| | | Enlisted Flyer | | | |
| | | 35 | -1.398 \pm 0.613 | 0.023 | OC>RH |
| | | 53 | -0.155 \pm 0.481 | 0.747 | |
| | | Enlisted Groundcrew | | | |
| | | 35 | -0.014 \pm 0.283 | 0.962 | |
| | | 53 | 1.230 \pm 0.526 | 0.020 | RH>OC |

TABLE N-8. (continued)

Summary of Group-by-Covariate
Interactions for Hematological Variables
(Original Comparisons Only)

| Variable | Interaction Covariates | Stratification | Ranch Hand-Original Comparison Group Difference \pm SE | p-Value | Direction of Result* |
|----------|------------------------|----------------------------|---|---------|-------------------------|
| HCT | Race | Nonblack <u>Officer</u> | | | |
| | | 35 | 0.506 \pm 0.325 | 0.120 | |
| | Occupation | 53 | -0.174 \pm 0.237 | 0.462 | |
| | Age (At Baseline) | | | | |
| | | <u>Enlisted Flyer</u> | | | |
| | | 35 | 0.390 \pm 0.377 | 0.301 | |
| | | 53 | -0.291 \pm 0.347 | 0.403 | |
| | | <u>Enlisted Groundcrew</u> | | | |
| | | 35 | 0.063 \pm 0.230 | 0.783 | |
| | | 53 | -0.617 \pm 0.307 | 0.045 | OC>RH |
| | | <u>Black</u> | | | |
| | | <u>Officer</u> | | | |
| | | 35 | -2.662 \pm 1.801 | 0.140 | |
| | | 53 | 0.825 \pm 1.805 | 0.648 | |
| | | <u>Enlisted Flyer</u> | | | |
| | | 35 | -4.365 \pm 1.753 | 0.013 | |
| | | 53 | -0.878 \pm 1.378 | 0.524 | OC>RH |
| | | <u>Enlisted Groundcrew</u> | | | |
| | | 35 | -0.050 \pm 0.806 | 0.950 | |
| | | 53 | 3.436 \pm 1.497 | 0.022 | RH>OC |

TABLE N-8. (continued)

Summary of Group-by-Covariate
Interactions for Hematological Variables
(Original Comparisons Only)

| Variable | Interaction Covariates | Stratification | Ranch Hand-Original Comparison Group Difference \pm SE | p-Value | Direction of Result* |
|----------|---|--|---|---------|-------------------------|
| MCV | Smoking (Smoking History and Current Smoking) | Nonsmoker | | | |
| | | 35 | 0.692 \pm 0.418 | 0.098 | RH>OC |
| | | 53 | -0.136 \pm 0.417 | 0.743 | |
| | Age (At Baseline) | 30 Pack-Years, Currently 1 Pack/Day | | | |
| | | 35 | 0.057 \pm 0.635 | 0.928 | |
| MCH | | 53 | -0.582 \pm 0.412 | 0.158 | |
| | | Nonsmoker | | | |
| | Current Smoking | 35 | 0.126 \pm 0.141 | 0.373 | |
| | | 53 | 0.158 \pm 0.132 | 0.232 | |
| | Age (At Baseline) | 1 Pack/Day | | | |
| | | 35 | 0.254 \pm 0.144 | 0.079 | RH>OC OC>RH |
| | | 53 | -0.275 \pm 0.149 | 0.066 | |
| | | 2 Pack/Day | | | |
| | | 35 | 0.381 \pm 0.273 | 0.162 | OC>RH |
| | | 53 | -0.707 \pm 0.281 | 0.012 | |

TABLE N-8. (continued)

Summary of Group-by-Covariate
Interactions for Hematological Variables
(Original Comparisons Only)

| Variable | Interaction Covariates | Stratification | Ranch Hand-Original Comparison Group Difference \pm SE | p-Value | Direction of Result* |
|------------------|------------------------|------------------------------|---|---------|-------------------------|
| PLT ^a | Race | Nonblack <u>Nonsmoker</u> | | | |
| | Smoking History | 35 | 0.030 \pm 0.016 | 0.061 | RH>OC |
| | | 53 | -0.017 \pm 0.018 | 0.354 | |
| | Age (At Baseline) | 30 Pack-Years <u>35</u> | 0.050 \pm 0.020 | 0.012 | RH>OC |
| | | 53 | 0.003 \pm 0.016 | 0.858 | |
| | | Black <u>Nonsmoker</u> | | | |
| | | 35 | -0.082 \pm 0.051 | 0.111 | |
| | | 53 | -0.129 \pm 0.054 | 0.016 | OC>RH |
| | | 30 Pack-Years <u>35</u> | 0.261 \pm 0.103 | 0.011 | RH>OC |
| | | 53 | 0.214 \pm 0.102 | 0.036 | RH>OC |

*RH>OC: Variable mean in Ranch Hand group greater than variable mean in Original Comparison group.

OC>RH: Variable mean in Original Comparison group greater than variable mean in Ranch Hand group.

^aUnits are on log scale.

TABLE N-9.

Longitudinal Analyses for
MCV, MCH, and PLT: A Contrast of
Baseline and First Followup Examination Test Means
(Original Comparisons Only)

| Variable | Group | Total | Means | | Difference (Followup-Baseline) | Error* | p-Value (Equality of Difference) |
|----------|------------------------|-------|----------|----------|-----------------------------------|--------|--|
| | | | Baseline | Followup | | | |
| MCV | Ranch Hand | 971 | 88.89 | 92.60 | +3.71 | 2.808 | 0.65 |
| | Original Comparison | 872 | 88.56 | 92.35 | +3.79 | | |
| MCH | Ranch Hand | 971 | 30.81 | 31.55 | +0.74 | 0.873 | 0.21 |
| | Original Comparison | 872 | 30.63 | 31.44 | +0.81 | | |
| PLT | Ranch Hand | 971 | 276.90 | 271.50 | -5.4 | 35.50 | 0.80 |
| | Original Comparison | 872 | 272.10 | 267.30 | -4.8 | | |

*Error = $\sqrt{\text{Subj} * \text{Time/Group mean squares.}}$

APPENDIX 0

Renal Assessment

TABLE 0-1.

Unadjusted Exposure Index Analyses for Renal Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | Contrast | Est. Relative Risk (95% C.I.) | p Value |
|-----------------|---------------------|-------------------|----------------|-----------|-----------|----------|-------------------------------|---------|
| | | | Low | Medium | High | | | |
| Kidney Disease | Officer | n | 127 | 130 | 123 | Overall | | 0.226 |
| | | Number/% Abnormal | 10 7.9% | 11 8.5% | 17 13.8% | H vs. L | 1.08 (0.44, 2.64) | 0.999 |
| | | Normal | 117 92.1% | 119 91.5% | 106 86.2% | H vs. L | 1.88 (0.82, 4.28) | 0.155 |
| | Enlisted Flyer | n | 55 | 65 | 57 | Overall | | 0.165 |
| | | Number/% Abnormal | 7 12.7% | 8 12.3% | 2 3.5% | H vs. L | 0.96 (0.33, 2.85) | 0.999 |
| | | Normal | 48 87.3% | 57 87.7% | 55 96.5% | H vs. L | 0.25 (0.05, 1.26) | 0.091 |
| Urinary Protein | Enlisted Groundcrew | n | 153 | 163 | 141 | Overall | | 0.214 |
| | | Number/% Abnormal | 18 11.8% | 11 6.7% | 10 7.1% | H vs. L | 0.54 (0.25, 1.19) | 0.172 |
| | | Normal | 135 88.2% | 152 93.3% | 131 92.9% | H vs. L | 0.57 (0.26, 1.29) | 0.233 |
| | Officer | n | 127 | 130 | 123 | Overall | | 0.696 |
| | | Number/% Abnormal | 4 3.1% | 2 1.5% | 3 2.4% | H vs. L | 0.48 (0.09, 2.67) | 0.443 |
| | | Normal | 123 96.9% | 128 98.5% | 120 97.6% | H vs. L | 0.77 (0.17, 3.51) | 0.999 |
| Urinary Protein | Enlisted Flyer | n | 55 | 65 | 57 | Overall | | 0.708 |
| | | Number/% Abnormal | 2 3.6% | 1 1.5% | 1 1.8% | H vs. L | 0.41 (0.04, 4.69) | 0.593 |
| | | Normal | 53 96.4% | 64 98.5% | 56 98.2% | H vs. L | 0.47 (0.04, 5.37) | 0.615 |
| | Enlisted Groundcrew | n | 154 | 163 | 142 | Overall | | 0.726 |
| | | Number/% Abnormal | 8 5.2% | 7 4.3% | 9 6.3% | H vs. L | 0.82 (0.29, 2.32) | 0.794 |
| | | Normal | 146 94.8% | 156 95.7% | 133 93.7% | H vs. L | 1.24 (0.46, 3.29) | 0.804 |

TABLE 0-1. (continued)

Unadjusted Exposure Index Analyses for Renal Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | Contrast | Est. Relative Risk (95% C.I.) | p Value |
|--------------------------------|---------------------|-------------------|----------------|----------|----------|----------|-------------------------------|---------|
| | | | Low | Medium | High | | | |
| Urinary Occult Blood | Officer | n | 127 | 130 | 123 | Overall | | 0.334 |
| | | Number/% Abnormal | 17 13.4% | 15 11.5% | 22 17.9% | M vs. L | 0.84 (0.40, 1.77) | 0.708 |
| | Enlisted Flyer | n | 110 | 115 | 101 | H vs. L | 1.41 (0.71, 2.81) | 0.385 |
| | | Number/% Abnormal | 86.6% | 88.5% | 82.1% | | | |
| | Enlisted Groundcrew | n | 55 | 65 | 57 | Overall | | 0.325 |
| | | Number/% Abnormal | 12 21.8% | 14 21.5% | 7 12.3% | M vs. L | 0.98 (0.41, 2.35) | 0.999 |
| Urinary White Blood Cell Count | Officer | n | 43 | 51 | 50 | H vs. L | 0.50 (0.18, 1.39) | 0.214 |
| | | Number/% Abnormal | 78.2% | 78.5% | 87.7% | | | |
| | Enlisted Flyer | n | 154 | 163 | 141 | Overall | | 0.144 |
| | | Number/% Abnormal | 25 16.2% | 34 20.9% | 36 25.5% | M vs. L | 1.36 (0.77, 2.41) | 0.315 |
| | Enlisted Groundcrew | n | 129 | 129 | 105 | H vs. L | 1.77 (1.00, 3.13) | 0.061 |
| | | Number/% Abnormal | 83.8% | 79.1% | 74.5% | | | |
| Urinary White Blood Cell Count | Officer | n | 127 | 130 | 123 | Overall | | 0.558 |
| | | Number/% Abnormal | 11 8.7% | 7 5.4% | 10 8.1% | M vs. L | 0.60 (0.23, 1.60) | 0.337 |
| | Enlisted Flyer | n | 116 | 123 | 113 | H vs. L | 0.93 (0.38, 2.28) | 0.999 |
| | | Number/% Abnormal | 91.3% | 94.6% | 91.9% | | | |
| | Enlisted Groundcrew | n | 55 | 65 | 57 | Overall | | 0.763 |
| | | Number/% Abnormal | 7 12.7% | 8 12.3% | 5 8.8% | M vs. L | 0.96 (0.33, 2.85) | 0.999 |
| Urinary White Blood Cell Count | Officer | n | 48 | 57 | 52 | H vs. L | 0.66 (0.20, 2.22) | 0.554 |
| | | Number/% Abnormal | 87.3% | 87.7% | 91.2% | | | |
| | Enlisted Flyer | n | 154 | 163 | 142 | Overall | | 0.447 |
| | | Number/% Abnormal | 20 13.0% | 15 9.2% | 19 13.4% | M vs. L | 0.68 (0.33, 1.38) | 0.290 |
| | Enlisted Groundcrew | n | 134 | 148 | 123 | H vs. L | 1.04 (0.53, 2.03) | 0.999 |
| | | Number/% Abnormal | 87.0% | 90.8% | 86.6% | | | |

TABLE 0-1. (continued)
Unadjusted Exposure Index Analyses for Renal Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | Contrast | Est. Relative Risk (95% C.I.) | p Value |
|------------------------|---------------------|-----------|------------------|------------------|------------------|----------|-------------------------------|---------|
| | | | Low | Medium | High | | | |
| Blood Urea Nitrogen | Officer | n | 127 | 130 | 123 | Overall | | 0.891 |
| | | Mean* | 14.62 | 14.82 | 14.74 | H vs. L | | 0.633 |
| | | 95% C.I.* | (14.05, 15.19) | (14.20, 15.46) | (14.14, 15.35) | H vs. L | | 0.775 |
| Blood Urea Nitrogen | Enlisted Flyer | n | 55 | 65 | 57 | Overall | | 0.983 |
| | | Mean* | 13.84 | 13.80 | 13.93 | H vs. L | | 0.963 |
| | | 95% C.I.* | (12.79, 14.93) | (12.87, 14.77) | (13.15, 14.72) | H vs. L | | 0.895 |
| Blood Urea Nitrogen | Enlisted Groundcrew | n | 154 | 163 | 142 | Overall | | 0.639 |
| | | Mean* | 14.08 | 13.72 | 14.00 | H vs. L | | 0.389 |
| | | 95% C.I.* | (13.50, 14.67) | (13.15, 14.30) | (13.48, 14.52) | H vs. L | | 0.841 |
| Urine Specific Gravity | Officer | n | 127 | 130 | 123 | Overall | | 0.786 |
| | | Mean | 1.0144 | 1.0149 | 1.0150 | H vs. L | | 0.554 |
| | | 95% C.I. | (1.0132, 1.0156) | (1.0137, 1.0161) | (1.0137, 1.0162) | H vs. L | | 0.541 |
| Urine Specific Gravity | Enlisted Flyer | n | 55 | 65 | 57 | Overall | | 0.358 |
| | | Mean | 1.0159 | 1.0155 | 1.0141 | H vs. L | | 0.803 |
| | | 95% C.I. | (1.0139, 1.0178) | (1.0138, 1.0173) | (1.0123, 1.0158) | H vs. L | | 0.178 |
| Urine Specific Gravity | Enlisted Groundcrew | n | 154 | 163 | 142 | Overall | | 0.967 |
| | | Mean | 1.0167 | 1.0168 | 1.0166 | H vs. L | | 0.885 |
| | | 95% C.I. | (1.0156, 1.0178) | (1.0158, 1.0179) | (1.0154, 1.0179) | H vs. L | | 0.907 |

*Transformed from square root scale.

--No relative risk given for variables analyzed continuously.

TABLE 0-2.
Interaction Summaries of Adjusted Exposure Index Analyses for Renal Variables

| Variable | Interaction (Occupation) | Stratification | Statistic | Exposure Index | | | Contrast | Adj. Relative Risk (95% C.I.) | p Value | |
|-------------------|--|-------------------|-------------------|----------------|---------|---------|-------------------|----------------------------------|----------------------|--------|
| | | | | Low | Medium | High | | | | |
| Urinary Protein | Exposure Index-by-Diabetic Class (Officer) | Diabetic | n | 8 | 8 | 14 | Overall | | 0.010* | |
| | | | Number/% Abnormal | 3 | 37.5% | 0 | 0.0% | H vs. L | 0.09 (0.004, 2.16)** | |
| | | | Normal | 5 | 62.5% | 8 | 100.0% | H vs. L | 0.05 (0.002, 1.22)** | |
| | | Impaired | n | 11 | 14 | 16 | Overall | | 0.247* | |
| | | | Number/% Abnormal | 1 | 9.1% | 0 | 0.0% | H vs. L | 0.24 (0.01, 6.53)** | |
| | | | Normal | 10 | 90.9% | 14 | 100.0% | H vs. L | 0.21 (0.008, 5.71)** | |
| | Normal | n | 108 | 108 | 93 | Overall | | 0.190* | | |
| | | Number/% Abnormal | 0 | 0.0% | 2 | 1.9% | H vs. L | 5.09 (0.24, 107.36)** | | |
| | | Normal | 108 | 100.0% | 106 | 98.1% | H vs. L | 8.39 (0.43, 164.61)** | | |
| | | Overall | 138 | 149 | 129 | Overall | | 0.259* | | |
| Urinary Protein | Exposure Index-by-Race (Enlisted Groundcrew) | Nonblack | n | 4 | 6 | 9 | H vs. L | 1.41 (0.39, 5.09)* | 0.751* | |
| | | | Number/% Abnormal | 134 | 97.1% | 143 | 96.0% | H vs. L | 2.51 (0.75, 8.37)* | 0.158* |
| | | | Normal | 16 | 14 | 13 | Overall | | 0.092* | |
| | | Black | n | 4 | 1 | 0 | H vs. L | 0.23 (0.02, 2.37)* | 0.336* | |
| | | | Number/% Abnormal | 12 | 75.0% | 13 | 92.9% | H vs. L | 0.10 (0.005, 2.11)** | 0.107* |
| | | | Normal | 87 | 129 | 81 | Overall | | | |
| | Born ≥1942 | n | 11 | 23 | 20 | H vs. L | 1.56 (0.71, 3.41) | 0.252 | | |
| | | Number/% Abnormal | 76 | 87.4% | 106 | 82.2% | H vs. L | 2.32 (0.73, 7.32) | 0.466 | |
| | | Normal | 67 | 34 | 60 | Overall | | | | |
| | | Born <1942 | n | 14 | 11 | 16 | H vs. L | 1.73 (0.68, 4.42) | 0.265 | |
| Number/% Abnormal | 53 | | 79.1% | 23 | 67.6% | H vs. L | 1.36 (0.59, 3.12) | 0.152 | | |
| Normal | | | | | Overall | | | | | |

TABLE 0-2. (continued)

Interaction Summaries of Adjusted Exposure Index Analyses for Renal Variables

| Variable | Interaction (Occupation) | Stratification Statistic | Exposure Index | | | Contrast | Adj. Relative Risk (95% C.I.) | p Value |
|--|------------------------------|-----------------------------|----------------|--------|------|----------------|----------------------------------|---------|
| | | | Low | Medium | High | | | |
| Urinary White Blood Cell Count(a) | Born ≥ 1942 Diabetic | n | 0 | 1 | 0 | Overall | | |
| | | Number/% Abnormal | 0 | 1 | 0 | H vs. L | | |
| | | Normal | 0 | 0 | 0 | H vs. L | | |
| | | | | | | | | |
| | Born ≥ 1942 Impaired | n | 1 | 1 | 0 | Overall | | 0.157* |
| | | Number/% Abnormal | 0 | 1 | 0 | H vs. L | 9.00 (0.10, 831.78)** | 0.999* |
| | | Normal | 1 | 0 | 0 | H vs. L | | |
| | | | | | | | | |
| | Born ≥ 1942 Normal | n | 10 | 16 | 9 | Overall | | 0.065* |
| | | Number/% Abnormal | 3 | 0 | 1 | 11.1% H vs. L | 0.07 (0.003, 1.42)** | 0.046* |
| | | Normal | 7 | 16 | 8 | 88.9% H vs. L | 0.29 (0.02, 3.48)** | 0.382* |
| | | | | | | | | |
| Exposure Index-by- Age | Born < 1942 Diabetic | n | 1 | 8 | 5 | Overall | | 0.668* |
| | | Number/% Abnormal | 0 | 1 | 0 | H vs. L | 0.60 (0.02, 23.07)** | 0.999* |
| | | Normal | 1 | 7 | 5 | 100.0% H vs. L | | |
| | | | | | | | | |
| | Born < 1942 Impaired | n | 8 | 6 | 6 | Overall | | 0.222* |
| | | Number/% Abnormal | 0 | 2 | 1 | 16.7% H vs. L | 9.44 (0.37, 242.18)** | 0.165* |
| | | Normal | 8 | 4 | 5 | 83.3% H vs. L | 4.64 (0.16, 135.57)** | 0.429* |
| | | | | | | | | |
| | Born < 1942 Normal | n | 35 | 33 | 37 | Overall | | 0.805 |
| | | Number/% Abnormal | 4 | 4 | 3 | 8.1% H vs. L | 0.79 (0.16, 3.90) | 0.776 |
| | | Normal | 31 | 29 | 34 | 91.9% H vs. L | 0.58 (0.11, 3.03) | 0.515 |
| | | | | | | | | |

TABLE 0-2. (continued)

Interaction Summaries of Adjusted Exposure Index Analyses for Renal Variables

| Variable | Interaction (Occupation) | Stratification | Statistic | Exposure Index | | | Contrast | Adj. Relative Risk (95% C.I.) | p Value |
|---------------------------|--|----------------|------------------------------|-------------------------|-------------------------|-------------------------|----------|----------------------------------|---------|
| | | | | Low | Medium | High | | | |
| Blood Urea Nitrogen | Exposure Index-by- Race (Officer) | Nonblack | n | 125 | 127 | 121 | H vs. L | (b) | 0.877 |
| | | | Adj. Mean(c) 95% C.I. (c) | 14.65 (13.91, 15.41) | 14.71 (13.96, 15.49) | 14.55 (13.84, 15.27) | H vs. L | (b) | 0.814 |
| | | Black | n | 2 | 2 | 3 | H vs. L | (b) | 0.015 |
| | | | Adj. Mean 95% C.I. | 16.93 (12.24, 22.38) | 10.65 (7.62, 14.19) | 19.51 (14.45, 25.33) | H vs. L | (b) | 0.494 |

*Unadjusted estimate of relative risk and confidence interval, or p-value, based on stratified tables.

**Unadjusted estimate of relative risk and confidence interval calculated after adding 0.5 to each cell.

—Zero counts in cells do not allow for calculation of percent, relative risk, confidence interval, or p-value.

(a) Results presented for urinary white blood cell count are based on stratification into the six categories shown. Unadjusted results are presented for all strata except Ranch Hands in normal diabetic class, born before 1942. These results have been adjusted for race.

(b) No relative risk given for variables analyzed continuously.

(c) Transformed from square root scale.

Note: Small sample sizes may affect validity of overall p-value.

Note: Results without (*) or (**) are adjusted for all other main effects in model (age, race, and diabetic class), unless otherwise noted.

TABLE 0-3.

Unadjusted Analyses for Renal Variables by Group
(Original Comparisons Only)

| Variable | Statistic | Group | | | | Est. Relative Risk (95% C.I.) | p-Value |
|--------------------------------|-----------|----------------------------|---------|----------------------------|---------|-------------------------------|---------|
| | | Ranch Hand | | Original Comparison | | | |
| | | Number | Percent | Number | Percent | | |
| Kidney Disease | n | 1,014 | | 954 | | | |
| | Yes | 94 | 9.3 | 94 | 9.9 | 0.93 (0.69, 1.26) | 0.701 |
| | No | 920 | 90.7 | 859 | 90.1 | | |
| Urinary Protein | n | 1,016 | | 954 | | | |
| | Abnormal | 37 | 3.6 | 28 | 2.9 | 1.25 (0.76, 2.06) | 0.449 |
| | Normal | 979 | 96.4 | 926 | 97.1 | | |
| Urinary Occult Blood | n | 1,015 | | 954 | | | |
| | Abnormal | 182 | 17.9 | 155 | 16.2 | 1.13 (0.89, 1.43) | 0.338 |
| | Normal | 833 | 82.1 | 799 | 83.8 | | |
| Urinary White Blood Cell Count | n | 1,016 | | 954 | | | |
| | Abnormal | 102 | 10.0 | 83 | 8.7 | 1.17 (0.86, 1.59) | 0.316 |
| | Normal | 914 | 90.0 | 871 | 91.3 | | |
| Blood Urea Nitrogen | n | | | | | | |
| | Mean* | 1,016 | | 955 | | -- | 0.318 |
| | 95% C.I.* | 14.21 (13.99, 14.43) | | 14.37 (14.15, 14.59) | | | |
| Urine Specific Gravity | n | 1,016 | | 954 | | | |
| | Mean | 1.0157 (1.0153, 1.0162) | | 1.0154 (1.0150, 1.0159) | | -- | 0.365 |
| | 95% C.I. | | | | | | |

*Converted from square root scale.

--No relative risk given for variables analyzed continuously.

TABLE 0 4.

Adjusted Analyses for Renal Variables by Group
(Original Comparisons Only)

| Variable | Strati- fication | Statistic | Group | | Adj. Relative Risk (95% C.I.) | p-Value | Covariate Remarks* |
|----------------------------|---------------------|-----------|---------------|------------------------|----------------------------------|---------|---|
| | | | Ranch Hand | Original Comparison | | | |
| Kidney Disease | | n | 1,014 | 950 | 0.95 (0.70, 1.28) | 0.726 | AGE (p=0.001) |
| Urinary Protein | | n | 1,016 | 942 | **** | **** | OCC (p=0.007) AGE*DIAB (p=0.037) GRP*DIAB (p=0.003) |
| Urinary Occult Blood | | | | | | | GRP*OCC*RACE (p=0.020) |
| | Nonblack | n | 955 | 887 | 1.14 (0.89, 1.46) | 0.299 | AGE (p=0.003) OCC (p<0.001) |
| | Black Enlisted | n | 53 | 51 | 1.43 (0.54, 3.76) | 0.465 | GRP*OCC (p=0.051) AGE*DIAB (p=0.027) |

TABLE 0-4. (continued)
Adjusted Analyses for Renal Variables by Group
(Original Comparisons Only)

| Variable | Stratification | Statistic | Group | | Adj. Relative Risk (95% C.I.) | p Value | Covariate Remarks* |
|--------------------------------|----------------|-----------|-------|---------------------|-------------------------------|---------|--|
| | | | Race | Original Comparison | | | |
| Urinary White Blood Cell Count | Nonblack | n | 956 | 893 | **** | **** | GRP*AGE*ACE (p=0.048) GRP*OCC*ACE (p=0.022) OCC (p=0.010) GRP*DIAB (p=0.054) GRP*AGE (p=0.053) |
| | | | | | | | |
| Blood Urea Nitrogen | Black Enlisted | n | 53 | 51 | **** | **** | GRP*OCC (p=0.015) DIAB (p=0.017) GRP*AGE (p=0.010) AGE (p<0.001) OCC (p=0.025) RACE*DIAB (p=0.049) GRP*ACE (p=0.077) |
| | | | | | | | |
| Urine Specific Gravity | | n | 1,016 | 951 | -- | **** | DIAB (p=0.011) OCC (p<0.001) GRP*ACE (p=0.037) |
| | | | | | | | |

*Abbreviations:

OCC: occupation

DIAB: diabetic class

***Group-by-covariate interaction--adjusted relative risk/group means, p-value, and confidence interval are not presented.

--No relative risk given for variables analyzed continuously.

TABLE 0 5.

Summary of Group by Covariate Interactions for Renal Variables
(Original Comparisons Only)

| Variable | Interaction | Stratification | Statistic | Group | | Adj. Relative Risk (95% C.I.) | p Value |
|----------------------|------------------------------------|----------------|-----------------------------|------------|---------------------|-------------------------------|---------|
| | | | | Rauch Hand | Original Comparison | | |
| Urinary Protein | Diabetic | n | Number/% Abnormal Normal | 7/8 | 76 | 0.57 (0.20, 1.60) | 0.286 |
| | | | | 7 | 11 | | |
| | | | | 71 | 65 | | |
| | Group by- Diabetic Class | n | Number/% Abnormal Normal | 106 | 136 | 0.58 (0.19, 1.75) | 0.332 |
| | | | | 5 | 11 | | |
| | | | | 101 | 125 | | |
| Urinary Occult Blood | Normal | n | Number/% Abnormal Normal | 832 | 739 | 3.82 (1.56, 9.37) | 0.004 |
| | | | | 25 | 6 | | |
| | | | | 807 | 733 | | |
| | Officer | n | Number/% Abnormal Normal | 7 | 7 | | |
| | | | | 0 | 3 | | |
| | | | | 7 | 4 | | |
| Urinary Occult Blood | Enlisted Flyer | n | Number/% Abnormal Normal | 10 | 12 | | |
| | | | | 3 | 1 | | |
| | | | | 7 | 11 | | |
| | Group-by- Occupation (Black) | n | Number/% Abnormal Normal | 43 | 39 | | |
| | | | | 13 | 9 | | |
| | | | | 30 | 30 | | |

TABLE 0-5. (continued)
Summary of Group-by-Covariate Interactions for Renal Variables
(Original Comparisons Only)

| Variable | Interaction | Stratification | Statistic | Group | | Adj. Relative Risk (95% C.I.) | p Value |
|--------------------------------|---------------------------|---------------------------|-----------|------------|---------------------|-------------------------------|---------|
| | | | | Ranch Hand | Original Comparison | | |
| Urinary White Blood Cell Count | Nonblack: Group-by-Age | Born \geq 1942 Diabetic | n | 14 | 12 | 0.90 (0.38, 2.10) | 0.799 |
| | | | Abnormal | 1 | 2 | | |
| | | Born \leq 1942 Impaired | n | 22 | 33 | 4.12 (2.06, 8.24) | <0.001 |
| | | | Abnormal | 2 | 4 | | |
| | | Born \geq 1942 Normal | n | 20 | 29 | 2.08 (1.16, 3.71) | 0.014 |
| | | | Abnormal | 344 | 298 | | |
| | Group-by-Diabetic Class | Born \leq 1942 Diabetic | n | 38 | 13 | 0.38 (0.14, 1.04) | 0.059 |
| | | | Abnormal | 306 | 285 | | |
| | | Born $<$ 1942 Impaired | n | 57 | 57 | 1.77 (0.75, 4.17) | 0.191 |
| | | | Abnormal | 6 | 12 | | |
| | | Born $<$ 1942 Normal | n | 51 | 45 | 0.89 (0.55, 1.44) | 0.639 |
| | | | Abnormal | 80 | 89 | | |

TABLE 0-5. (continued)

Summary of Group by Covariate Interactions for Renal Variables
(Original Comparisons Only)

| Variable | Interaction | Stratification | Statistic | Group | | Original Comparison | Adj. Relative Risk (95% C.I.) | p Value |
|--------------------------------|-------------------------------|----------------|-----------|------------|-------|---------------------|-------------------------------|---------|
| | | | | Ranch Hand | | | | |
| Urinary White Blood Cell Count | Group-by-Occupation (Black) | Officer | n | 7 | 7 | | | |
| | | | Number/% | | | | | |
| | | | Abnormal | 0 | 2 | 28.6% | | |
| | | Normal | 7 | 5 | 71.4% | | | |
| | | Enlisted Flyer | n | 10 | 12 | | | |
| | | | Number/% | | | | | |
| | Abnormal | | 3 | 0 | 0.0% | | | |
| | Normal | 7 | 12 | 100.0% | | | | |
| | Enlisted Groundcrew | n | 43 | 39 | | | | |
| | | Number/% | | | | | | |
| Abnormal | | 7 | 7 | 17.9% | | | | |
| Normal | | 36 | 32 | 82.1% | | | | |
| Urinary White Blood Cell Count | Group-by-Age (Black Enlisted) | Born ≥1942 | n | 29 | 26 | | | |
| | | | Number/% | | | | | |
| | | | Abnormal | 4 | 5 | 19.2% | 0.65 (0.15, 2.78) | 0.565 |
| | | Normal | 25 | 21 | 80.8% | | | |
| | | Born <1942 | n | 24 | 25 | | | |
| | | | Number/% | | | | | |
| | Abnormal | | 6 | 2 | 8.0% | 4.99 (0.79, 31.56) | 0.088 | |
| | Normal | 18 | 23 | 92.0% | | | | |

TABLE 0 5. (continued)

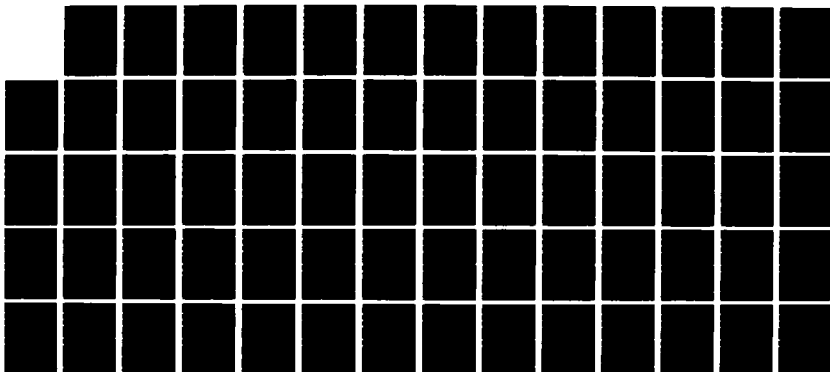
Summary of Group-by Covariate Interactions for Renal Variables
(Original Comparisons Only)

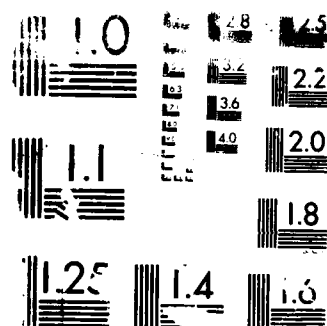
| Variable | Interaction | Stratification | Statistic | Group | | Adj. Relative Risk (95% C.I.) | p Value |
|------------------------|---------------|----------------|-------------------------|----------------------------|----------------------------|-------------------------------|---------|
| | | | | Ranch Hand | Original Comparison | | |
| Blood Urea Nitrogen | Group-by-Race | Nonblack | n | 956 | 894 | -- | 0.726 |
| | | | Adj. Mean* 95% C.I.* | 14.16 (13.86, 14.47) | 14.22 (13.92, 14.53) | | |
| | | Black | n | 60 | 58 | -- | 0.057 |
| | | | Adj. Mean* 95% C.I.* | 12.43 (11.41, 13.51) | 13.63 (12.66, 14.64) | | |
| Urine Specific Gravity | Group-by-Race | Nonblack | n | 956 | 893 | -- | 0.104 |
| | | | Adj. Mean 95% C.I. | 1.0163 (1.0157, 1.0169) | 1.0158 (1.0151, 1.0164) | | |
| | | Black | n | 60 | 58 | -- | 0.081 |
| | | | Adj. Mean 95% C.I. | 1.0154 (1.0135, 1.0173) | 1.0177 (1.0158, 1.0196) | | |

No relative risk given for variables analyzed continuously. Also, no relative risk or p-value given for interactions involving occupation for urinary occult blood and urinary white blood cell count; tables presented only for illustrative purposes.

*Transformed from square root scale.

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RESOLUTION TEST CHART

APPENDIX P
Endocrine Assessment

APPENDIX P: Endocrine Assessment

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TABLE P-1.

Summary of Group-by-Covariate Interactions for Endocrinological Variables

| Variable | Interaction | Stratification | Statistic | Group | | p-Value |
|------------------------------|------------------------|----------------|-----------|----------------|-----------------|---------|
| | | | | Ranch Hand | Comparison | |
| Testosterone | <10% | | n | 6 | 4 | |
| | | | Mean | 522.6 | 1044.8 | |
| | | | Adj. Mean | 654.4 | 1042.8 | 0.012 |
| | 10-25% | | 95% C.I. | (484.7, 849.5) | (803.5, 1313.2) | |
| | | | n | 815 | 1026 | |
| | | | Mean | 627.8 | 605.7 | |
| Group-by- % Body Fat | 10-25% | | Adj. Mean | 603.3 | 582.4 | 0.023 |
| | | | 95% C.I. | (583.4, 623.5) | (563.9, 601.3) | |
| | >25% | | n | 179 | 257 | |
| | | | Mean | 470.5 | 470.3 | |
| | | | Adj. Mean | 463.0 | 456.7 | 0.706 |
| | | | 95% C.I. | (435.0, 491.9) | (432.9, 481.2) | |
| Differential Cortisol | Nonblack Born ≥1942 | | n | 374 | 500 | |
| | | | Mean | 2.07 | 2.44 | |
| | | | Adj. Mean | 1.58 | 1.97 | 0.156 |
| | Nonblack Born <1942 | | 95% C.I. | (0.64, 2.51) | (1.06, 2.88) | |
| | | | n | 572 | 697 | |
| | | | Mean | 2.53 | 2.46 | |
| Group-by- Race-by- Age | Black Born ≥1942 | | Adj. Mean | 2.08 | 1.99 | 0.708 |
| | | | 95% C.I. | (1.18, 2.97) | (1.10, 2.88) | |
| | Black Born <1942 | | n | 32 | 47 | |
| | | | Mean | 0.17 | 2.78 | |
| | | | Adj. Mean | -0.46 | 2.33 | 0.003 |
| | | | 95% C.I. | (-2.11, 1.18) | (0.89, 3.76) | |
| | Black Born <1942 | | n | 26 | 36 | |
| | | | Mean | 3.24 | 2.30 | |
| | | | Adj. Mean | 2.94 | 1.89 | 0.312 |
| | | | 95% C.I. | (1.22, 4.67) | (0.32, 3.46) | |

TABLE P-2.

Unadjusted Exposure Index Analyses for Endocrinological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | Contrast | p-Value |
|-------------------------|---------------------|-----------|----------------|----------------|----------------|----------|---------|
| | | | Low | Medium | High | | |
| T ₃ % Uptake | Officer | n | 126 | 124 | 122 | Overall | 0.250 |
| | | Mean | 28.01 | 28.35 | 27.96 | M vs. L | 0.177 |
| | | 95% C.I. | (27.66, 28.36) | (28.00, 28.71) | (27.61, 28.32) | H vs. L | 0.857 |
| | Enlisted Flyer | n | 55 | 65 | 55 | Overall | 0.362 |
| | | Mean | 27.31 | 27.59 | 27.83 | M vs. L | 0.411 |
| | | 95% C.I. | (26.82, 27.81) | (27.14, 28.06) | (27.32, 28.34) | H vs. L | 0.155 |
| | Enlisted Groundcrew | n | 153 | 161 | 142 | Overall | 0.775 |
| | | Mean | 27.68 | 27.65 | 27.53 | M vs. L | 0.865 |
| | | 95% C.I. | (27.37, 28.00) | (27.34, 27.95) | (27.21, 27.85) | H vs. L | 0.493 |
| TSH | Officer | n | 126 | 124 | 122 | Overall | 0.283 |
| | | Mean | 1.181 | 1.167 | 1.278 | M vs. L | 0.843 |
| | | 95% C.I. | (1.089, 1.286) | (1.076, 1.271) | (1.173, 1.397) | H vs. L | 0.203 |
| | Enlisted Flyer | n | 55 | 65 | 55 | Overall | 0.181 |
| | | Mean | 1.033 | 1.153 | 1.204 | M vs. L | 0.178 |
| | | 95% C.I. | (0.924, 1.162) | (1.035, 1.292) | (1.068, 1.367) | H vs. L | 0.075 |
| | Enlisted Groundcrew | n | 153 | 161 | 142 | Overall | 0.738 |
| | | Mean | 1.117 | 1.124 | 1.160 | M vs. L | 0.899 |
| | | 95% C.I. | (1.043, 1.199) | (1.051, 1.204) | (1.079, 1.250) | H vs. L | 0.465 |

TABLE P-2. (continued)
Unadjusted Exposure Index Analyses for Endocrinological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | Contrast | p-Value |
|------------------|---------------------|-----------|----------------|----------------|----------------|----------|---------|
| | | | Low | Medium | High | | |
| Testosterone | Officer | n | 125 | 128 | 118 | Overall | 0.099 |
| | | Mean | 599.4 | 547.4 | 558.0 | M vs. L | 0.041 |
| | | 95% C.I. | (563.8, 636.1) | (513.8, 582.1) | (522.7, 594.4) | H vs. L | 0.112 |
| Testosterone | Enlisted Flyer | n | 55 | 63 | 57 | Overall | 0.363 |
| | | Mean | 588.7 | 637.4 | 584.9 | M vs. L | 0.244 |
| | | 95% C.I. | (531.6, 648.6) | (581.8, 695.6) | (529.1, 643.6) | H vs. L | 0.929 |
| Testosterone | Enlisted Groundcrew | n | 162 | 153 | 139 | Overall | 0.276 |
| | | Mean | 609.3 | 641.4 | 603.4 | M vs. L | 0.205 |
| | | 95% C.I. | (574.7, 644.9) | (606.9, 676.9) | (567.3, 640.6) | H vs. L | 0.820 |
| Initial Cortisol | Officer | n | 124 | 130 | 121 | Overall | 0.186 |
| | | Mean | 11.97 | 11.43 | 12.28 | M vs. L | 0.239 |
| | | 95% C.I. | (11.33, 12.65) | (10.83, 12.07) | (11.61, 12.99) | H vs. L | 0.531 |
| Initial Cortisol | Enlisted Flyer | n | 55 | 65 | 57 | Overall | 0.276 |
| | | Mean | 11.97 | 11.08 | 11.13 | M vs. L | 0.001 |
| | | 95% C.I. | (11.09, 12.91) | (10.33, 11.88) | (10.33, 11.99) | H vs. L | 0.092 |
| Initial Cortisol | Enlisted Groundcrew | n | 154 | 161 | 142 | Overall | 0.699 |
| | | Mean | 11.69 | 11.33 | 11.50 | M vs. L | 0.397 |
| | | 95% C.I. | (11.09, 12.32) | (10.76, 11.92) | (10.89, 12.15) | H vs. L | 0.678 |

TABLE P-2. (continued)

Unadjusted Exposure Index Analyses for Endocrinological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | Contrast | p-Value |
|-----------------------|---------------------|-----------|----------------|---------------|---------------|----------|---------|
| | | | Low | Medium | High | | |
| 2-Hour Cortisol | Officer | n | 124 | 130 | 121 | Overall | 0.416 |
| | | Mean | 9.27 | 9.16 | 9.69 | M vs. L | 0.789 |
| | | 95% C.I. | (8.72, 9.86) | (8.63, 9.73) | (9.10, 10.32) | H vs. L | 0.324 |
| 2-Hour Cortisol | Enlisted Flyer | n | 55 | 65 | 57 | Overall | 0.200 |
| | | Mean | 8.43 | 9.48 | 9.06 | M vs. L | 0.074 |
| | | 95% C.I. | (7.67, 9.26) | (8.69, 10.34) | (8.25, 9.94) | H vs. L | 0.286 |
| 2-Hour Cortisol | Enlisted Groundcrew | n | 154 | 161 | 142 | Overall | 0.453 |
| | | Mean | 9.64 | 9.29 | 9.17 | M vs. L | 0.358 |
| | | 95% C.I. | (9.11, 10.19) | (8.79, 9.81) | (8.65, 9.72) | H vs. L | 0.229 |
| Differential Cortisol | Officer | n | 124 | 130 | 121 | Overall | 0.709 |
| | | Mean | 2.69 | 2.31 | 2.59 | M vs. L | 0.424 |
| | | 95% C.I. | (2.02, 3.36) | (1.66, 2.96) | (1.91, 3.26) | H vs. L | 0.829 |
| Differential Cortisol | Enlisted Flyer | n | 55 | 65 | 57 | Overall | 0.003 |
| | | Mean | 3.43 | 1.20 | 2.30 | M vs. L | <0.001 |
| | | 95% C.I. | (2.50, 4.36) | (0.34, 2.06) | (1.39, 3.22) | H vs. L | 0.092 |
| Differential Cortisol | Enlisted Groundcrew | n | 154 | 161 | 142 | Overall | 0.726 |
| | | Mean | 1.96 | 2.12 | 2.37 | M vs. L | 0.740 |
| | | 95% C.I. | (1.26, 2.66) | (1.44, 2.81) | (1.64, 3.09) | H vs. L | 0.425 |

TABLE P-2. (continued)
Unadjusted Exposure Index Analyses for Endocrinological Variables by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | Contrast | p-Value |
|------------------------------|----------------|-----------|----------------|----------------|----------------|----------|---------|
| | | | Low | Medium | High | | |
| Officer | | n | 121 | 113 | 124 | Overall | 0.892 |
| | | Mean | 109.0 | 107.5 | 107.6 | M vs. L | 0.666 |
| | | 95% C.I. | (104.3, 113.8) | (103.0, 112.3) | (102.9, 112.6) | H vs. L | 0.694 |
| 2-Hour Post-prandial Glucose | Enlisted Flyer | n | 54 | 62 | 56 | Overall | 0.051 |
| | | Mean | 100.9 | 118.0 | 110.9 | M vs. L | 0.015 |
| | | 95% C.I. | (92.1, 110.6) | (108.3, 128.5) | (101.4, 121.4) | H vs. L | 0.149 |
| Enlisted Groundcrew | | n | 150 | 156 | 140 | Overall | 0.674 |
| | | Mean | 105.5 | 106.7 | 109.1 | M vs. L | 0.750 |
| | | 95% C.I. | (100.1, 111.1) | (101.4, 112.4) | (103.3, 115.2) | H vs. L | 0.380 |

TABLE P-3.

Interaction Summaries of Adjusted Exposure Index Analyses for Endocrinological Variables

| Variable | Interaction (Occupation) | Stratifi- cation | Statistic | Exposure Index | | | Contrast | p-Value |
|--------------------|-----------------------------|--|-----------|----------------|-----------------|----------------|----------|---------|
| | | | | Low | Medium | High | | |
| Testosterone | <10% | Exposure Index-by- % Body Fat | n | 1 | 2 | 3 | | |
| | | | Adj. Mean | 72.7 | 828.8 | 684.5 | M vs. L | <0.001 |
| | | | 95% C.I. | (0.3, 273.0) | (537.8, 1182.5) | (465.4, 945.8) | H vs. L | <0.001 |
| | 10-25% | (Enlisted Groundcrew) | n | 125 | 128 | 105 | | |
| | | | Adj. Mean | 630.0 | 646.2 | 644.7 | M vs. L | 0.527 |
| | | | 95% C.I. | (586.1, 675.5) | (601.6, 692.5) | (598.2, 692.9) | H vs. L | 0.585 |
| 2-Hour Cortisol | >25% | Exposure Index-by- % Body Fat (Officer) | n | 27 | 31 | 29 | | |
| | | | Adj. Mean | 501.8 | 503.0 | 467.5 | M vs. L | 0.980 |
| | | | 95% C.I. | (433.9, 574.7) | (437.6, 573.0) | (400.7, 539.6) | H vs. L | 0.471 |
| | 10-25% | Nonblack | n | 102 | 110 | 99 | | |
| | | | Adj. Mean | 8.31 | 8.50 | 9.05 | M vs. L | 0.629 |
| | | | 95% C.I. | (7.20, 9.58) | (7.41, 9.76) | (7.86, 10.43) | H vs. L | 0.079 |
| 2-Hour Cortisol | >25% | Black | n | 22 | 20 | 20 | | |
| | | | Adj. Mean | 10.03 | 7.46 | 8.26 | M vs. L | 0.006 |
| | | | 95% C.I. | (8.27, 12.18) | (6.12, 9.10) | (6.77, 10.07) | H vs. L | 0.068 |
| | Nonblack | Exposure Index-by- Race | n | 138 | 146 | 129 | | |
| | | | Adj. Mean | 9.30 | 9.33 | 9.32 | M vs. L | 0.921 |
| | | | 95% C.I. | (8.30, 10.42) | (8.38, 10.41) | (8.33, 10.43) | H vs. L | 0.961 |
| 2-Hour Cortisol | Black | (Enlisted Groundcrew) | n | 16 | 14 | 11 | | |
| | | | Adj. Mean | 12.89 | 9.36 | 8.41 | M vs. L | 0.013 |
| | | | 95% C.I. | (10.59, 15.67) | (7.61, 11.52) | (7.48, 10.48) | H vs. L | 0.002 |

TABLE P-3. (continued)

Interaction Summaries of Adjusted Exposure Index Analyses for Endocrinological Variables

| Variable | Interaction (Occupation) | Stratification | Statistic | Exposure Index | | | Contrast | p-Value |
|-----------------------|--|-----------------|-----------|----------------|---------------|----------------|----------|---------|
| | | | | Low | Medium | High | | |
| Initial Cortisol | Exposure Index-by-% Body Fat (Officer) | 10-25% | n | 102 | 110 | 99 | | |
| | | | Adj. Mean | 11.51 | 11.19 | 12.25 | M vs. L | 0.514 |
| | | | 95% C.I. | (10.13, 13.08) | (9.89, 12.66) | (10.80, 13.91) | H vs. L | 0.154 |
| | >25% | | n | 22 | 20 | 20 | | |
| | | | Adj. Mean | 12.28 | 9.59 | 10.26 | M vs. L | 0.010 |
| | | | 95% C.I. | (10.33, 14.60) | (8.03, 11.45) | (8.59, 12.26) | H vs. L | 0.060 |
| Differential Cortisol | Exposure Index-by-Race-by-Personality Type (Enlisted Groundcrew) | Nonblack Type A | n | 49 | 63 | 53 | | |
| | | | Adj. Mean | 0.96 | 1.94 | 2.00 | M vs. L | 0.237 |
| | | | 95% C.I. | (-0.74, 2.66) | (0.38, 3.49) | (0.32, 3.68) | H vs. L | 0.223 |
| | | Nonblack Type B | n | 89 | 83 | 76 | | |
| | | | Adj. Mean | 2.29 | 1.36 | 1.64 | M vs. L | 0.158 |
| | | | 95% C.I. | (0.80, 3.78) | (-0.12, 2.84) | (0.14, 3.14) | H vs. L | 0.336 |
| | Black Type A | Black Type A | n | 8 | 5 | 4 | | |
| | | | Adj. Mean | -5.49 | 3.27 | 3.10 | M vs. L | <0.001 |
| | | | 95% C.I. | (-8.70, -2.28) | (-0.71, 7.25) | (-1.30, 7.49) | H vs. L | 0.001 |
| | | Black Type B | n | 8 | 9 | 7 | | |
| | | | Adj. Mean | 1.16 | 2.99 | 0.48 | M vs. L | 0.384 |
| | | | 95% C.I. | (-2.04, 4.37) | (-0.07, 6.05) | (-2.80, 3.76) | H vs. L | 0.762 |

TABLE P-4.

Unadjusted Continuous and Categorical Analyses for Laboratory Endocrinological Variables by Group
(Original Comparisons Only)

| Variable | Statistic | Group | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|-----------------------|-----------|------------------|---------------------|-----------------|-------------------------------|---------|
| | | Ranch Hand | Original Comparison | | | |
| T ₃ Uptake | n | 1,003 | 936 | | | |
| | Mean | 27.79 | 27.68 | | | 0.203 |
| | 95% C.I. | (27.67, 27.91) | (27.55, 27.80) | | | |
| | Number/% | | | | | |
| | Low | 7 0.7% | 13 1.4% | Overall | | 0.322 |
| TSH | Normal | 969 96.6% | 898 95.9% | Low vs. Normal | 0.50 (0.20, 1.26) | 0.177 |
| | High | 27 2.7% | 25 2.7% | High vs. Normal | 1.00 (0.58, 1.74) | 0.999 |
| | n | 1,003 | 936 | | | |
| | Mean | 1.16 | 1.11 | | -- | 0.040 |
| | 95% C.I. | (1.13, 1.19) | (1.08, 1.14) | | | |
| Testosterone | Number/% | | | | | |
| | Normal | 996 99.3% | 931 99.5% | | 1.31 (0.41, 4.14) | 0.775 |
| | High | 7 0.7% | 5 0.5% | | | |
| | n | 1,000 | 952 | | | |
| | Mean | 597.31 | 570.90 | | -- | 0.006 |
| Initial Cortisol | 95% C.I. | (583.97, 610.80) | (557.69, 584.27) | | | |
| | Number/% | | | | | |
| | Low | 38 3.8% | 37 3.9% | Overall | | 0.955 |
| | Normal | 949 94.9% | 904 95.0% | Low vs. Normal | 0.98 (0.62, 1.55) | 0.999 |
| | High | 13 1.3% | 11 1.2% | High vs. Normal | 1.13 (0.50, 2.53) | 0.839 |
| | n | 1,009 | 949 | | | |
| | Mean | 11.62 | 11.67 | | -- | 0.729 |
| | 95% C.I. | (11.39, 11.85) | (11.44, 11.91) | | | |
| | Number/% | | | | | |
| | Low | 52 5.2% | 44 4.6% | Overall | | 0.864 |
| | Normal | 950 94.2% | 898 94.6% | Low vs. Normal | 1.12 (0.74, 1.69) | 0.603 |
| | High | 7 0.7% | 7 0.7% | High vs. Normal | 0.95 (0.33, 2.71) | 0.999 |

TABLE P-4. (continued)
Unadjusted Continuous and Categorical Analyses for Laboratory Endocrinological Variables by Group
(Original Comparisons Only)

| Variable | Statistic | Group | | Contrast | Est. Relative Risk (95% C.I.) | p-Value |
|--------------------------------|-----------|------------------|---------------------|---------------------|-------------------------------|---------|
| | | Ranch Hand | Original Comparison | | | |
| 2-Hour Cortisol | n | 1,009 | 949 | | | |
| | Mean | 9.30 | 9.32 | | -- | 0.924 |
| | 95% C.I. | (9.10, 9.51) | (9.11, 9.52) | | | |
| | Number/% | | | | | |
| | Low | 0 | 0 | 0.0% | | |
| Differential Cortisol | Normal | 1,005 | 946 | 99.7% | | |
| | High | 4 | 3 | 0.3% | 1.26 (0.28, 5.62) | 0.999 |
| | | | | | | |
| 2-Hour Post-prandial Glucose | n | 1,009 | 949 | | | |
| | Mean | 2.30 | 2.38 | | -- | 0.692 |
| | 95% C.I. | (2.05, 2.55) | (2.12, 2.64) | | | |
| | Number/% | | | | | |
| | Normal | 976 | 909 | | | |
| Diabetes (Composite Indicator) | Impaired | 107.93 | 110.03 | | | |
| | Diabetic | (105.90, 110.01) | (108.03, 112.07) | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Diabetes (Composite Indicator) | n | 836 | 748 | Overall | | |
| | Mean | 106 | 137 | Impaired vs. Normal | 0.69 (0.53, 0.91) | 0.009 |
| | 95% C.I. | 34 | 24 | Diabetic vs. Normal | 1.27 (0.75, 2.16) | 0.423 |
| | Number/% | | | | | |
| | Yes | 1,016 | 955 | | | |
| Diabetes (Composite Indicator) | No | 74 | 67 | | | |
| | | 942 | 888 | | 1.04 (0.74, 1.47) | 0.861 |
| | | | | | | |

-- No relative risk or confidence interval given for continuous analysis.

TABLE P-5.

Adjusted Continuous and Categorical Analyses for Laboratory Endocrinological Variables by Group
(Original Comparisons Only)

| Variable | Statistic | Group | | Contrast | Adj. Relative Risk (95% C.I.) | p-Value | Covariate Remarks |
|-----------------------|-----------|----------------|---------------------|-----------------|-------------------------------|---------|------------------------|
| | | Ranch Hand | Original Comparison | | | | |
| T_3 Uptake | n | 998 | 933 | Overall | — | 0.332 | 00C (p=0.025) |
| | | | | Low vs. Normal | 0.52 (0.45, 2.36) | 0.153 | PERSTYPE (p=0.035) |
| | | | | High vs. Normal | 1.03 (0.59, 1.78) | 0.916 | |
| TSH | n | 1,003 | 936 | | | | |
| | Adj. Mean | 1.16 | 1.11 | | — | 0.020 | AGE (p<0.001) |
| | 95% C.I. | (1.13, 1.19) | (1.08, 1.14) | | | | |
| Testosterone | n | 1,000 | 951 | High vs. Normal | 1.31 (0.41, 4.14) | 0.775 | |
| | Adj. Mean | **** | **** | | | **** | RACE (p=0.015) |
| | 95% C.I. | **** | **** | | | | AGE*BFAT (p=0.039) |
| Initial Cortisol | n | 1,000 | 951 | | | | GRP*BFAT (p=0.022) |
| | Adj. Mean | 11.35 | 11.38 | Overall | | | |
| | 95% C.I. | (10.49, 12.27) | (10.52, 12.32) | Low vs. Normal | 1.01 90.63, 1.61) | 0.998 | AGE (p<0.001) |
| Differential Cortisol | n | 1,004 | 945 | High vs. Normal | 1.02 (0.42, 2.52) | 0.980 | ZBFAT (p<0.001) |
| | Adj. Mean | **** | **** | | | 0.958 | |
| | 95% C.I. | **** | **** | | | | AGE (p<0.001) |
| Differential Cortisol | n | 1,004 | 945 | | | 0.820 | ZBFAT (p<0.001) |
| | Adj. Mean | **** | **** | | | | PERSTYPE (p=0.028) |
| | 95% C.I. | **** | **** | | | | 00C*RACE (p=0.026) |
| Differential Cortisol | n | 1,004 | 945 | | | **** | GRP*AGE*RACE (p=0.016) |
| | Adj. Mean | **** | **** | | | | PERSTYPE (p=0.002) |
| | 95% C.I. | **** | **** | | | | ZBFAT (p=0.006) |

TABLE P-5. (continued)
Adjusted Continuous and Categorical Analyses for Laboratory Endocrinological Variables by Group
(Original Comparisons Only)

| Variable | Group | | | Contrast | Adj. Relative Risk (95% C.I.) | p-Value | Covariate Remarks |
|--------------------------------|-----------|----------------|---------------------|---|--|---------|--|
| | Statistic | Rank | Original Comparison | | | | |
| 2-Hour Post-prandial Glucose | n | 976 | 908 | Overall Impaired vs. Normal Diabetic vs. Normal | 0.71 (0.54, 0.93) 1.29 (0.71, 2.38) | 0.430 | %BFAT (p<0.001) OCC (p=0.002) AGE*RACE (p=0.002) |
| | Adj. Mean | 114.8 | 116.0 | | | | |
| | 95% C.I. | (107.2, 122.9) | (108.3, 124.2) | | | | |
| Diabetes (Composite Indicator) | n | 1,016 | 954 | Overall Impaired vs. Normal Diabetic vs. Normal | 1.13 (0.80, 1.61) | 0.484 | AGE (p<0.001) %BFAT (p<0.001) RACE (p=0.015) |
| | | | | | | | |
| | | | | | | | |

***Group-by-covariate interaction—adjusted mean/relative risk, confidence interval, and p-value are not presented.
—No relative risk or confidence interval given for continuous analyses.

GRP: Group
OCC: Occupation
PERTYPE: Personality type (A or B)
%BFAT: Percent body fat

TABLE P-6.

**Summary of Group-by-Covariate Interactions for Endocrinological Variables
(Original Comparisons Only)**

| Variable | Interaction | Stratification | Statistic | Group | | p-Value |
|--------------------------------------|------------------------|----------------|-----------|----------------|---------------------|---------|
| | | | | Ranch Hand | Original Comparison | |
| Testosterone | <10% | | n | 6 | 3 | |
| | | | Mean | 522.6 | 1173.8 | |
| | | | Adj. Mean | 640.1 | 1074.7 | 0.014 |
| | 10-25% | | 95% C.I. | (472.2, 833.5) | (794.4, 1397.2) | |
| | | | n | 815 | 757 | |
| | | | Mean | 627.8 | 595.9 | |
| | | | Adj. Mean | 602.3 | 577.7 | 0.013 |
| | >25% | | 95% C.I. | (581.2, 623.7) | (556.7, 599.1) | |
| | | | n | 179 | 191 | |
| Differential Cortisol | Nonblack Born ≥1942 | | Mean | 470.5 | 470.7 | |
| | | | Adj. Mean | 461.5 | 459.1 | 0.891 |
| | | | 95% C.I. | (432.9, 491.1) | (431.8, 487.2) | |
| | Nonblack Born <1942 | | n | 374 | 342 | |
| | | | Mean | 2.07 | 2.34 | |
| | | | Adj. Mean | 1.36 | 1.65 | 0.331 |
| | Black Born ≥1942 | | 95% C.I. | (0.38, 2.34) | (0.67, 2.64) | |
| | | | n | 572 | 545 | |
| | | | Mean | 2.53 | 2.36 | |
| Differential Cortisol Race-by-Age | Nonblack Born <1942 | | Adj. Mean | 1.85 | 1.66 | 0.419 |
| | | | 95% C.I. | (0.92, 2.79) | (0.71, 2.60) | |
| | Black Born ≥1942 | | n | 32 | 27 | |
| | | | Mean | 0.17 | 3.05 | |
| | | | Adj. Mean | -0.68 | 2.41 | 0.004 |
| | Black Born <1942 | | 95% C.I. | (-2.35, 0.99) | (0.64, 4.17) | |
| | | | n | 26 | 31 | |
| | | | Mean | 3.24 | 2.22 | |
| | | | Adj. Mean | 2.72 | 1.54 | 0.274 |
| | | | 95% C.I. | (0.98, 4.47) | (-0.14, 3.23) | |

APPENDIX Q
Immunological Evaluation

APPENDIX Q: Immunological Evaluation

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TABLE Q-1.

Summary of Group-by-Covariate Interactions for Immunological Variables

| Variable | Interaction | Stratification | Statistic | Group | | p-Value |
|--------------------------------|--|---------------------|-----------|----------------|----------------|---------|
| | | | | Ranch Hand | Comparison | |
| Total T Cells | Group-by-Race | Nonblack | n | 424 | 532 | 0.619 |
| | | | Adj. Mean | 1,616 | 1,599 | |
| | | | 95% C.I. | (1,564, 1,669) | (1,554, 1,646) | |
| | | Black | n | 18 | 35 | 0.039 |
| | | | Adj. Mean | 1,566 | 1,888 | |
| | | | 95% C.I. | (1,340, 1,810) | (1,705, 2,080) | |
| B Cells (Nonblacks Only) | Group-by- Lifetime Smoking (Pack-years) | 0 | n | 128 | 149 | 0.004 |
| | | | Adj. Mean | 153.8 | 189.9 | |
| | | | 95% C.I. | (135.6, 173.3) | (170.9, 210.0) | |
| | | >0-20 | n | 200 | 265 | 0.998 |
| | | | Adj. Mean | 199.5 | 199.6 | |
| | | | 95% C.I. | (182.9, 216.9) | (185.3, 214.3) | |
| | | >20-40 | n | 74 | 94 | 0.109 |
| | | | Adj. Mean | 200.4 | 172.8 | |
| | | | 95% C.I. | (174.0, 228.7) | (151.5, 195.4) | |
| | | >40 | n | 32 | 29 | 0.857 |
| | | | Adj. Mean | 219.9 | 214.4 | |
| | | | 95% C.I. | (178.0, 266.3) | (172.5, 260.9) | |
| Monocytes | Group-by- Occupation Group-by- Current Alcohol Use (Drinks/day) | Officer 0 | n | 35 | 30 | 0.060 |
| | | | Adj. Mean | 44.19 | 32.33 | |
| | | | 95% C.I. | (34.72, 56.23) | (24.88, 42.03) | |
| | | Officer >0-2 | n | 100 | 131 | 0.569 |
| | | | Adj. Mean | 40.43 | 38.38 | |
| | | | 95% C.I. | (34.35, 47.59) | (33.00, 44.64) | |
| | | Officer >2-4 | n | 31 | 37 | 0.689 |
| | | | Adj. Mean | 41.53 | 44.35 | |
| | | | 95% C.I. | (32.00, 53.91) | (35.02, 56.17) | |
| | | Officer >4 | n | 13 | 17 | 0.608 |
| | | | Adj. Mean | 37.65 | 33.12 | |
| | | | 95% C.I. | (25.58, 55.43) | (25.18, 43.56) | |
| | | Enlisted Flyer 0 | n | 21 | 27 | 0.232 |
| | | | Adj. Mean | 35.65 | 45.10 | |
| | | | 95% C.I. | (26.32, 48.28) | (34.36, 59.20) | |

TABLE Q-1. (continued)

Summary of Group-by-Covariate Interactions for Immunological Variables

| Variable | Interaction | Stratification | Statistic | Group | | p-Value |
|----------------------|---|----------------|----------------------------|--------------------------------|--------------------------------|---------|
| | | | | Ranch Hand | Comparison | |
| Monocytes (Cont.) | Enlisted Flyer | >0-2 | n Adj. Mean 95% C.I. | 35 34.95 (27.53, 44.36) | 50 43.22 (35.00, 53.37) | 0.159 |
| | | >2-4 | n Adj. Mean 95% C.I. | 8 32.71 (20.35, 52.56) | 9 56.23 (36.38, 86.89) | 0.097 |
| | | >4 | n Adj. Mean 95% C.I. | 5 41.10 (22.28, 75.80) | 11 36.17 (23.99, 54.54) | 0.729 |
| | Enlisted Groundcrew | 0 | n Adj. Mean 95% C.I. | 76 45.04 (37.89, 53.54) | 96 48.98 (41.73, 57.50) | 0.421 |
| | | >0-2 | n Adj. Mean 95% C.I. | 81 42.42 (35.81, 50.24) | 120 41.59 (36.10, 47.91) | 0.839 |
| | | >2-4 | n Adj. Mean 95% C.I. | 19 45.15 (33.05, 61.67) | 17 37.37 (27.08, 51.57) | 0.397 |
| | | >4 | n Adj. Mean 95% C.I. | 16 68.86 (49.04, 96.68) | 23 35.32 (26.42, 47.23) | 0.003 |
| HLA-DR Cells | Group-by- Current Alcohol Use (Drinks/day) | 0 | n Adj. Mean 95% C.I. | 142 593.1 (555.1, 632.2) | 158 581.0 (544.4, 618.9) | 0.650 |
| | | >0-2 | n Adj. Mean 95% C.I. | 223 559.5 (529.5, 590.3) | 306 582.8 (557.0, 609.2) | 0.232 |
| | | >2-4 | n Adj. Mean 95% C.I. | 58 553.4 (497.8, 611.9) | 65 565.9 (512.7, 621.7) | 0.750 |
| | | >4 | n Adj. Mean 95% C.I. | 36 563.7 (491.7, 640.6) | 51 472.7 (417.7, 531.0) | 0.052 |

TABLE Q-1. (continued)

Summary of Group-by-Covariate Interactions for Immunological Variables

| Variable | Interaction | Stratification | Statistic | Group | | p-Value |
|------------------------|--|----------------|-----------|------------------|------------------|---------|
| | | | | Ranch Hand | Comparison | |
| MLC Net Response | Group-by- Lifetime Smoking (Pack-years) | 0 | n | 129 | 156 | 0.053 |
| | | | Adj. Mean | 68,921 | 77,232 | |
| | | | 95% C.I. | (56,625, 82,424) | (64,572, 91,025) | |
| | | >0-20 | n | 201 | 277 | 0.057 |
| | | | Adj. Mean | 67,976 | 74,333 | |
| | | | 95% C.I. | (56,990, 79,930) | (62,947, 86,665) | |
| | | >20-40 | n | 71 | 88 | 0.128 |
| | | | Adj. Mean | 76,511 | 67,758 | |
| | | | 95% C.I. | (63,097, 91,216) | (55,676, 81,025) | |
| | | >40 | n | 29 | 29 | 0.444 |
| | | | Adj. Mean | 71,116 | 63,991 | |
| | | | 95% C.I. | (54,784, 89,576) | (48,837, 81,189) | |

TABLE Q-2.

Unadjusted Exposure Index Analyses for Cell Surface Markers by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | Contrast | p-Value |
|----------------|---------------------|-----------|-----------------|-----------------|----------------|----------|---------|
| | | | Low | Medium | High | | |
| Total T Cells | Officer | n | 62 | 63 | 56 | Overall | 0.885 |
| | | Mean | 1,594 | 1,550 | 1,578 | M vs. L | 0.626 |
| | | 95% C.I. | (1471, 1723) | (1429, 1676) | (1449, 1713) | H vs. L | 0.865 |
| Total T Cells | Enlisted Flyer | n | 24 | 20 | 28 | Overall | 0.923 |
| | | Mean | 1,677 | 1,659 | 1,622 | M vs. L | 0.901 |
| | | 95% C.I. | (1477, 1889) | (1464, 1866) | (1439, 1815) | H vs. L | 0.697 |
| Total T Cells | Enlisted Groundcrew | n | 69 | 78 | 59 | Overall | 0.076 |
| | | Mean | 1,759 | 1,555 | 1,586 | M vs. L | 0.032 |
| | | 95% C.I. | (1623, 1901) | (1434, 1680) | (1446, 1732) | H vs. L | 0.091 |
| Helper T Cells | Officer | n | 62 | 63 | 55 | Overall | 0.970 |
| | | Mean | 838.3 | 839.6 | 852.7 | M vs. L | 0.983 |
| | | 95% C.I. | (755.8, 925.1) | (757.7, 925.8) | (764.5, 945.8) | H vs. L | 0.821 |
| Helper T Cells | Enlisted Flyer | n | 24 | 26 | 27 | Overall | 0.832 |
| | | Mean | 917.5 | 888.3 | 861.7 | M vs. L | 0.755 |
| | | 95% C.I. | (789.3, 1055.3) | (767.1, 1018.5) | (744.5, 987.5) | H vs. L | 0.545 |
| Helper T Cells | Enlisted Groundcrew | n | 69 | 76 | 59 | Overall | 0.296 |
| | | Mean | 948.9 | 865.4 | 874.6 | M vs. L | 0.146 |
| | | 95% C.I. | (867.6, 1033.9) | (791.3, 942.7) | (790.4, 963.1) | H vs. L | 0.227 |

TABLE Q-2. (continued)
Unadjusted Exposure Index Analyses for Cell Surface Markers by Occupation

| Variable | Occupation | Statistic | Exposure Index | | Contrast | p-Value |
|-----------------------|------------------------|-----------|----------------|----------------|----------|---------|
| | | | Low | High | | |
| Suppressor T Cells | Officer | n | 62 | 56 | Overall | 0.287 |
| | | Mean | 522.6 | 497.3 | M vs. L | 0.117 |
| | | 95% C.I. | (467.9, 583.6) | (442.7, 558.7) | H vs. L | 0.546 |
| | Enlisted Flyer | n | 24 | 28 | Overall | 0.891 |
| | | Mean | 528.1 | 557.7 | M vs. L | 0.930 |
| | | 95% C.I. | (443.1, 629.3) | (474.1, 656.0) | H vs. L | 0.656 |
| | Enlisted Groundcrew | n | 69 | 59 | Overall | 0.123 |
| | | Mean | 575.5 | 505.5 | M vs. L | 0.063 |
| | | 95% C.I. | (518.9, 638.3) | (451.9, 565.3) | H vs. L | 0.097 |
| B Cells | Officer | n | 62 | 55 | Overall | 0.453 |
| | | Mean | 167.4 | 176.8 | M vs. L | 0.445 |
| | | 95% C.I. | (143.5, 193.2) | (150.7, 205.0) | H vs. L | 0.618 |
| | Enlisted Flyer | n | 24 | 26 | Overall | 0.262 |
| | | Mean | 233.2 | 183.3 | M vs. L | 0.897 |
| | | 95% C.I. | (185.4, 286.6) | (142.7, 228.9) | H vs. L | 0.144 |
| | Enlisted Groundcrew | n | 69 | 59 | Overall | 0.966 |
| | | Mean | 202.4 | 199.2 | M vs. L | 0.792 |
| | | 95% C.I. | (173.3, 233.8) | (168.8, 226.8) | H vs. L | 0.889 |

TABLE Q-2. (continued)
Unadjusted Exposure Index Analyses for Cell Surface Markers by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | Contrast | p-Value |
|--------------|------------------------|-----------|----------------|----------------|----------------|----------|---------|
| | | | Low | Medium | High | | |
| Monocytes | Officer | n | 62 | 64 | 55 | Overall | 0.799 |
| | | Mean | 43.32 | 46.85 | 47.39 | M vs. L | 0.584 |
| | | 95% C.I. | (35.48, 52.89) | (38.49, 57.02) | (38.34, 58.58) | H vs. L | 0.546 |
| Monocytes | Enlisted Flyer | n | 24 | 26 | 27 | Overall | 0.816 |
| | | Mean | 36.91 | 37.52 | 41.76 | M vs. L | 0.940 |
| | | 95% C.I. | (27.27, 49.97) | (28.05, 50.20) | (31.38, 55.56) | H vs. L | 0.563 |
| Monocytes | Enlisted Groundcrew | n | 69 | 76 | 59 | Overall | 0.975 |
| | | Mean | 46.97 | 47.03 | 48.18 | M vs. L | 0.992 |
| | | 95% C.I. | (39.65, 55.64) | (40.02, 55.27) | (40.12, 57.87) | H vs. L | 0.842 |
| HLA-DR Cells | Officer | n | 62 | 63 | 56 | Overall | 0.750 |
| | | Mean | 527.5 | 544.1 | 564.9 | M vs. L | 0.727 |
| | | 95% C.I. | (463.9, 595.1) | (480.0, 612.2) | (495.8, 638.7) | H vs. L | 0.449 |
| HLA-DR Cells | Enlisted Flyer | n | 24 | 26 | 28 | Overall | 0.932 |
| | | Mean | 570.3 | 547.1 | 568.3 | M vs. L | 0.739 |
| | | 95% C.I. | (475.4, 673.9) | (457.7, 644.5) | (480.3, 663.7) | H vs. L | 0.977 |
| HLA-DR Cells | Enlisted Groundcrew | n | 69 | 76 | 58 | Overall | 0.973 |
| | | Mean | 578.0 | 587.3 | 580.7 | M vs. L | 0.820 |
| | | 95% C.I. | (521.7, 637.1) | (533.2, 644.0) | (519.4, 645.6) | H vs. L | 0.949 |

TABLE Q-2. (continued)
Unadjusted Exposure Index Analyses for Cell Surface Markers by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | Contrast | p-Value |
|---|------------------------|-----------|----------------|----------------|----------------|----------|---------|
| | | | Low | Medium | High | | |
| T ₄ /T ₈ Ratio | Officer | n | 62 | 63 | 55 | Overall | 0.207 |
| | | Mean | 1.732 | 2.002 | 1.758 | M vs. L | 0.106 |
| | | 95% C.I. | (1.500, 1.964) | (1.773, 2.232) | (1.512, 2.004) | H vs. L | 0.881 |
| | Enlisted Flyer | n | 24 | 26 | 27 | Overall | 0.692 |
| | | Mean | 1.793 | 1.781 | 1.625 | M vs. L | 0.955 |
| | | 95% C.I. | (1.478, 2.108) | (1.478, 2.083) | (1.328, 1.922) | H vs. L | 0.449 |
| | Enlisted Groundcrew | n | 69 | 76 | 59 | Overall | 0.965 |
| | | Mean | 1.751 | 1.780 | 1.780 | M vs. L | 0.812 |
| | | 95% C.I. | (1.580, 1.922) | (1.617, 1.943) | (1.595, 1.965) | H vs. L | 0.822 |

TABLE Q-3.

Unadjusted Exposure Index Analyses for Functional Stimulation Tests by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | Contrast | p-Value |
|-----------------------------|---------------------|-----------|--------------------|--------------------|--------------------|----------|---------|
| | | | Low | Medium | High | | |
| Unstimulated Response (PHA) | Officer | n | 61 | 64 | 56 | Overall | 0.047 |
| | | Mean | 1,705 | 1,428 | 1,809 | M vs. L | 0.071 |
| | | 95% C.I. | (1487,1955) | (1249,1632) | (1568,2087) | H vs. L | 0.557 |
| Unstimulated Response (PHA) | Enlisted Flyer | n | 24 | 26 | 28 | Overall | 0.466 |
| | | Mean | 1,668 | 1,973 | 1,642 | M vs. L | 0.320 |
| | | 95% C.I. | (1315,2114) | (1571,2478) | (1318,2045) | H vs. L | 0.926 |
| Unstimulated Response (PHA) | Enlisted Groundcrew | n | 69 | 78 | 58 | Overall | 0.818 |
| | | Mean | 1,814 | 1,923 | 1,843 | M vs. L | 0.541 |
| | | 95% C.I. | (1583,2079) | (1691,2186) | (1588,2139) | H vs. L | 0.877 |
| PHA Net Response | Officer | n | 61 | 64 | 55 | Overall | 0.853 |
| | | Mean | 213,383 | 205,057 | 209,661 | M vs. L | 0.575 |
| | | 95% C.I. | (192,608, 234,158) | (184,775, 225,339) | (187,782, 231,539) | H vs. L | 0.809 |
| PHA Net Response | Enlisted Flyer | n | 24 | 26 | 28 | Overall | 0.297 |
| | | Mean | 245,179 | 209,656 | 219,358 | M vs. L | 0.131 |
| | | 95% C.I. | (212,269, 278,089) | (178,038, 241,275) | (188,890, 249,827) | H vs. L | 0.263 |
| PHA Net Response | Enlisted Groundcrew | n | 69 | 78 | 58 | Overall | 0.414 |
| | | Mean | 227,062 | 221,793 | 208,537 | M vs. L | 0.690 |
| | | 95% C.I. | (208,219, 245,905) | (204,070, 239,515) | (187,984, 229,089) | H vs. L | 0.194 |

TABLE Q-3. (continued)
Unadjusted Exposure Index Analyses for Functional Stimulation Tests by Occupation

| Variable | Occupation | Statistic | Exposure Index | | | Contrast | p-Value |
|-----------------------|---------------------|-----------|-------------------|-------------------|-------------------|----------|---------|
| | | | Low | Medium | High | | |
| Pokeweed Net Response | Officer | n | 62 | 64 | 56 | Overall | 0.633 |
| | | Mean | 85,479 | 86,250 | 96,107 | M vs. L | 0.947 |
| | | 95% C.I. | (70,144, 102,328) | (71,074, 102,894) | (78,992, 114,899) | H vs. L | 0.388 |
| Pokeweed Net Response | Enlisted Flyer | n | 24 | 26 | 28 | Overall | 0.004 |
| | | Mean | 92,847 | 101,256 | 55,480 | M vs. L | 0.619 |
| | | 95% C.I. | (71,008, 117,610) | (79,227, 125,985) | (40,058, 73,410) | H vs. L | 0.011 |
| Pokeweed Net Response | Enlisted Groundcrew | n | 69 | 78 | 58 | Overall | 0.345 |
| | | Mean | 77,859 | 92,188 | 87,540 | M vs. L | 0.151 |
| | | 95% C.I. | (64,872, 92,030) | (78,815, 106,610) | (72,540, 103,950) | H vs. L | 0.360 |
| MLC Net Response | Officer | n | 58 | 63 | 54 | Overall | 0.940 |
| | | Mean | 74,175 | 78,069 | 76,486 | M vs. L | 0.727 |
| | | 95% C.I. | (59,443, 90,536) | (63,516, 94,123) | (61,000, 93,722) | H vs. L | 0.841 |
| MLC Net Response | Enlisted Flyer | n | 23 | 26 | 26 | Overall | 0.724 |
| | | Mean | 71,959 | 74,217 | 62,391 | M vs. L | 0.892 |
| | | 95% C.I. | (50,336, 97,436) | (53,426, 98,416) | (43,471, 84,721) | H vs. L | 0.550 |
| MLC Net Response | Enlisted Groundcrew | n | 68 | 77 | 57 | Overall | 0.248 |
| | | Mean | 69,460 | 85,901 | 81,091 | M vs. L | 0.102 |
| | | 95% C.I. | (56,591, 83,647) | (72,345, 100,620) | (65,912, 97,842) | H vs. L | 0.275 |

TABLE Q-4.

Interaction Summaries of Adjusted Exposure Index Analyses for Immunological Variables

| Variable | Interaction (Occupation) | Stratification | Statistic | Exposure Index | | | Contrast | p-Value |
|--------------------------------|---|----------------|-----------|----------------|---------|---------|----------|---------|
| | | | | Low | Medium | High | | |
| Unstimulated Response (PHA) | Exposure Index-by- Lifetime | 0 | n | 4 | 0 | 5 | M vs. L | -- |
| | | | Adj. Mean | 3,273 | -- | 1,557 | H vs. L | 0.031 |
| | Alcohol Use (Drink/years) (Officer) | >0-5 | n | 22 | 22 | 16 | M vs. L | 0.655 |
| | | | Adj. Mean | 2,118 | 1,975 | 2,770 | H vs. L | 0.125 |
| | >5-30 | | n | 24 | 22 | 15 | M vs. L | 0.071 |
| | | | Adj. Mean | 2,752 | 2,069 | 2,788 | H vs. L | 0.941 |
| PHA Net Response | Exposure Index-by- Age (Officer) | Born ≥1942 | n | 18 | 9 | 7 | M vs. L | 0.002 |
| | | | Adj. Mean | 261,397 | 153,534 | 299,002 | H vs. L | 0.302 |
| | Born 1923-1941 | | n | 40 | 43 | 46 | M vs. L | 0.943 |
| | | | Adj. Mean | 234,921 | 236,262 | 223,373 | H vs. L | 0.534 |
| | Born ≤1922 | | n | 3 | 11 | 1 | M vs. L | 0.095 |
| | | | Adj. Mean | 139,307 | 229,757 | 191,111 | H vs. L | 0.632 |

TABLE Q-5.

Unadjusted Analyses for Cell Surface Markers by Group
(Original Comparisons Only)

| Variable | Statistic | Group | | p-Value |
|--------------------------------------|-----------|---------------|---------------------|---------|
| | | Ranch Hand | Original Comparison | |
| Total T Cells | n | 464 | 424 | 0.711 |
| | Mean | 1,606 | 1,592 | |
| | 95% C.I. | (1551,1662) | (1537,1648) | |
| Helper T Cells | n | 461 | 423 | 0.765 |
| | Mean | 868.1 | 861.0 | |
| | 95% C.I. | (833.3,903.6) | (826.4,896.3) | |
| Suppressor T Cells | n | 465 | 425 | 0.630 |
| | Mean | 521.9 | 529.7 | |
| | 95% C.I. | (498.5,546.5) | (505.7,554.8) | |
| B Cells | n | 457 | 418 | 0.708 |
| | Mean | 185.2 | 188.1 | |
| | 95% C.I. | (173.8,197.0) | (176.5,200.1) | |
| Monocytes | n | 462 | 424 | 0.744 |
| | Mean | 46.19 | 45.47 | |
| | 95% C.I. | (43.05,49.56) | (42.39,48.79) | |
| HLA-DR Cells | n | 462 | 424 | 0.917 |
| | Mean | 571.6 | 569.9 | |
| | 95% C.I. | (547.6,596.2) | (546.1,594.3) | |
| T ₄ /T ₈ Ratio | n | 461 | 421 | 0.410 |
| | Mean | 1.597 | 1.558 | |
| | 95% C.I. | (1.528,1.669) | (1.491,1.629) | |

TABLE Q-6.

Adjusted Analyses for Cell Surface Markers by Group
(Original Comparisons Only)

| Variable | Statistic | Group | | p-Value | Covariate Remarks* |
|-----------------------|-----------|----------------|------------------------|---------|------------------------|
| | | Ranch Hand | Original Comparison | | |
| Total T Cells | n | 442 | 414 | | BATCH (p<0.001) |
| | Adj. Mean | **** | **** | **** | GRP*RACE (p=0.028) |
| | 95% C.I. | **** | **** | | DRKYR*PACKYR (p=0.004) |
| | | | | | CSMOK (p<0.001) |
| Helper Cells | n | 439 | 413 | | BATCH (p=0.014) |
| | Adj. Mean | 862.9 | 867.5 | 0.835 | DAY (BATCH) (p=0.007) |
| | 95% C.I. | (829.8, 896.6) | (834.6, 901.1) | | AGE (p<0.001) |
| | | | | | CSMOK (p<0.001) |
| Suppressor T Cells | n | 465 | 425 | | ALC*OCC (p=0.025) |
| | Adj. Mean | **** | **** | **** | DRKYR*PACKYR (p=0.001) |
| | 95% C.I. | **** | **** | | BATCH (p<0.001) |
| | | | | | GRP*RACE (p=0.010) |
| B Cells | n | 455 | 416 | | OCC (p=0.021) |
| | Adj. Mean | 185.5 | 191.1 | 0.451 | AGE (p=0.006) |
| | 95% C.I. | (174.2, 197.1) | (179.6, 202.9) | | CSMOK (p<0.001) |
| | | | | | BATCH (p<0.001) |
| Monocytes | n | 440 | 414 | | OCC (p=0.041) |
| | Adj. Mean | **** | **** | **** | AGE (p=0.005) |
| | 95% C.I. | **** | **** | | ALC (p=0.002) |
| | | | | | CSMOK (p<0.001) |
| HLA-DR Cells | n | 461 | 423 | | PACKYR (p=0.020) |
| | Adj. Mean | 570.5 | 568.2 | 0.887 | BATCH (p<0.001) |
| | 95% C.I. | (546.9, 594.5) | (545.0, 592.0) | | DAY (BATCH) (p=0.014) |
| | | | | | OCC (p=0.017) |

TABLE Q-6. (continued)

Adjusted Analyses for Cell Surface Markers by Group
(Original Comparisons Only)

| Variable | Statistic | Group | | p-Value | Covariate Remarks* |
|---|-----------|------------|------------------------|---------|-----------------------|
| | | Ranch Hand | Original Comparison | | |
| T ₄ /T ₈ Ratio | n | 461 | 421 | | BATCH (p<0.001) |
| | Adj. Mean | **** | **** | **** | OCC (p=0.002) |
| | 95% C.I. | **** | **** | | GRP*CSMOK (p=0.016) |

*Abbreviations:

BATCH: batch-to-batch variation among examination groups

DAY (BATCH): blood-draw day variation

ALC: current alcohol use

CSMOK: current smoking

OCC: occupation

GRP: group

DRKYR: lifetime alcohol use (drink-years)

PACKYR: lifetime smoking (pack-years)

****Group-by-covariate interaction - adjusted mean, confidence interval, and p-value not presented.

TABLE Q-7.

Summary of Group-by-Covariate Interactions for Cell Surface Markers
(Original Comparisons Only)

| Variable | Interaction | Stratification | Statistic | Group | | p-Value |
|---|---|------------------|-----------|--------------------|---------------------|---------|
| | | | | Ranch Hand | Original Comparison | |
| Total T Cells | Group-by-Race | Nonblack | n | 424 | 391 | 0.324 |
| | | | Adj. Mean | 1,601.7 | 1,567.3 | |
| | | | 95% C.I. | (1,554.6, 1,649.6) | (1,518.6, 1,161.6) | |
| | | Black | n | 18 | 23 | 0.043 |
| | | | Adj. Mean | 1,558.3 | 1,888.6 | |
| | | | 95% C.I. | (1,338.6, 1,794.8) | (1,673.1, 2,117.1) | |
| Suppressor T Cells | Group-by-Race | Nonblack | n | 444 | 402 | 0.960 |
| | | | Adj. Mean | 530.0 | 530.8 | |
| | | | 95% C.I. | (505.5, 555.6) | (506.2, 556.6) | |
| | | Black | n | 21 | 23 | 0.008 |
| | | | Adj. Mean | 497.5 | 708.8 | |
| | | | 95% C.I. | (411.0, 602.2) | (589.6, 852.2) | |
| Monocytes | Group-by-Age | Born ≥ 1942 | n | 174 | 162 | 0.048 |
| | | | Adj. Mean | 41.39 | 48.02 | |
| | | | 95% C.I. | (36.88, 46.44) | (42.89, 53.76) | |
| | | Born 1923-1941 | n | 247 | 232 | 0.058 |
| | | | Adj. Mean | 48.20 | 42.82 | |
| | | | 95% C.I. | (44.04, 52.76) | (39.02, 46.99) | |
| | | Born ≤ 1922 | n | 19 | 20 | 0.924 |
| | | | Adj. Mean | 47.88 | 46.90 | |
| | | | 95% C.I. | (35.06, 65.40) | (34.85, 63.13) | |
| T ₄ /T ₈ Ratio | Group-by- Current Smoking (Cigarettes/ day) | 0 | n | 277 | 273 | 0.454 |
| | | | Adj. Mean | 1.44 | 1.48 | |
| | | | 95% C.I. | (1.36, 1.52) | (1.40, 1.56) | |
| | | >0-20 | n | 78 | 69 | 0.811 |
| | | | Adj. Mean | 1.70 | 1.73 | |
| | | | 95% C.I. | (1.54, 1.88) | (1.56, 1.92) | |
| | | >20-40 | n | 90 | 71 | 0.004 |
| | | | Adj. Mean | 1.84 | 1.51 | |
| | | | 95% C.I. | (1.68, 2.01) | (1.36, 1.67) | |
| | | >40 | n | 16 | 8 | 0.895 |
| | | | Adj. Mean | 1.70 | 1.75 | |
| | | | 95% C.I. | (1.38, 2.11) | (1.30, 2.35) | |

TABLE Q-8.

Unadjusted Analyses for Functional
Stimulation Tests by Group
(Original Comparisons Only)

| Variable | Statistic | Group | | p-Value |
|-----------------------------|-----------|--------------------|---------------------|---------|
| | | Ranch Hands | Original Comparison | |
| Unstimulated Response (PHA) | n | 464 | 426 | 0.608 |
| | Mean | 1,669 | 1,640 | |
| | 95% C.I. | (1,578, 1,755) | (1,559, 1,724) | |
| PHA Net Response | n | 463 | 425 | 0.168 |
| | Mean | 212,481 | 206,796 | |
| | 95% C.I. | (206,424, 218,539) | (200,733, 212,858) | |
| Pokeweed Net Response | n | 465 | 426 | 0.522 |
| | Mean | 85,559 | 83,724 | |
| | 95% C.I. | (81,373, 89,849) | (79,579, 87,974) | |
| MLC Net Response | n | 452 | 415 | 0.285 |
| | Mean | 79,451 | 82,387 | |
| | 95% C.I. | (75,485, 83,519) | (78,363, 86,512) | |

TABLE Q-9.

Adjusted Analyses for Functional Stimulation Tests by Group
(Original Comparisons Only)

| Variable | Statistic | Group | | p-Value | Covariate Remarks |
|-----------------------------------|-----------|------------------|------------------------|---------|---|
| | | Ranch Hand | Original Comparison | | |
| Unstimulated Response (PHA) | n | 464 | 426 | 0.613 | BATCH (p<0.001) |
| | Adj. Mean | 1,813 | 1,783 | | DAY (BATCH) (p<0.001) |
| | 95% C.I. | (1,645, 1,997) | (1,620, 1,962) | | RACE (p<0.001) AGE (p<0.001) |
| PHA Net Response | n | 461 | 423 | **** | BATCH (p<0.001) |
| | Adj. Mean | **** | **** | | DAY (BATCH) (p<0.001) |
| | 95% C.I. | **** | **** | | GRP*OCC (p=0.017) RACE (p=0.005) AGE (p=0.001) ALC*CSMOK (p=0.037) |
| Pokeweed Net Response | n | 465 | 426 | 0.746 | BATCH (p<0.001) |
| | Adj. Mean | 92,684 | 91,738 | | DAY (BATCH) (p<0.001) |
| | 95% C.I. | (86,712, 98,855) | (85,660, 98,023) | | OCC (p=0.046) CSMOK (p<0.001) |
| MLC Net Response | n | 431 | 405 | 0.197 | BATCH (p<0.001) |
| | Adj. Mean | 79,412 | 82,916 | | DAY (BATCH) (p<0.001) |
| | 95% C.I. | (73,680, 85,359) | (76,848, 89,214) | | ALC (p<0.001) DRKYR (p=0.001) CSMOK (p<0.001) |

****Group-by-covariate interaction - adjusted mean, confidence interval, and p-value not presented.

TABLE Q-10.

Summary of Group-by-Covariate Interactions for Functional Stimulation Tests
(Original Comparisons Only)

| Variable | Interaction | Stratification | Statistic | Group | | p-Value |
|------------------|--|---------------------|-----------|--------------------|---------------------|---------|
| | | | | Ranch Hand | Original Comparison | |
| PHA Net Response | Group-by-Occupation | Officer | n | 180 | 163 | |
| | | | Adj. Mean | 217,397 | 210,363 | 0.280 |
| | | | 95% C.I. | (201,412, 233,382) | (193,843, 226,883) | |
| | | Enlisted Flyer | n | 78 | 77 | |
| | | | Adj. Mean | 230,597 | 202,077 | 0.003 |
| | | | 95% C.I. | (212,032, 249,162) | (183,749, 220,405) | |
| | | Enlisted Groundcrew | n | 203 | 183 | |
| | | | Adj. Mean | 208,347 | 212,473 | 0.504 |
| | | | 95% C.I. | (193,386, 223,308) | (197,550, 227,397) | |
| MLC Net Response | Group-by-Lifetime Smoking (Pack-years) | 0 | n | 129 | 109 | |
| | | | Adj. Mean | 78,900 | 87,110 | 0.107 |
| | | | 95% C.I. | (69,737, 88,627) | (77,309, 97,496) | |
| | | >0-20 | n | 201 | 206 | |
| | | | Adj. Mean | 76,689 | 83,468 | 0.079 |
| | | | 95% C.I. | (69,735, 83,973) | (76,169, 91,101) | |
| | | >20-40 | n | 71 | 67 | |
| | | | Adj. Mean | 86,904 | 75,456 | 0.086 |
| | | | 95% C.I. | (77,241, 97,135) | (65,854, 85,711) | |
| | | >40 | n | 29 | 23 | |
| | | | Adj. Mean | 80,525 | 75,984 | 0.679 |
| | | | 95% C.I. | (66,260, 96,180) | (60,806, 92,850) | |

APPENDIX R
Pulmonary Disease

APPENDIX R: Pulmonary Disease

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APPENDIX R: Pulmonary Disease

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TABLE R-1.
Unadjusted Analyses of Respiratory Variables by Group
(Original Comparisons Only)

| Variable | Statistic | Group | | | | Est. Relative Risk (95% C.I.) | p-Value |
|----------------|--------------------|------------|--------------|---------------------|--------------|-------------------------------|---------|
| | | Ranch Hand | | Original Comparison | | | |
| | | Number | Percent | Number | Percent | | |
| Asthma | n | 1,016 | | 954 | | | |
| | Abnormal Normal | 44 972 | 4.3 95.7 | 42 912 | 4.4 95.6 | 0.98 (0.64, 1.51) | 0.92 |
| Bronchitis | n | 1,015 | | 954 | | | |
| | Abnormal Normal | 129 886 | 12.7 87.3 | 131 823 | 13.7 86.3 | 0.91 (0.71, 1.19) | 0.50 |
| Pleurisy | n | 1,016 | | 953 | | | |
| | Abnormal Normal | 47 969 | 4.6 95.4 | 45 908 | 4.7 95.3 | 0.98 (0.65, 1.49) | 0.92 |
| Pneumonia | n | 1,016 | | 953 | | | |
| | Abnormal Normal | 195 821 | 19.2 80.8 | 191 762 | 20.0 80.0 | 0.95 (0.76, 1.18) | 0.64 |
| Tuberculosis | n | 1,015 | | 954 | | | |
| | Abnormal Normal | 7 1,008 | 0.7 99.3 | 5 949 | 0.5 99.5 | 1.32 (0.43, 3.97) | 0.64 |
| Thorax & Lungs | n | 1,015 | | 955 | | | |
| | Abnormal Normal | 61 954 | 6.0 94.0 | 45 910 | 4.7 95.3 | 1.29 (0.87, 1.92) | 0.20 |

TABLE K-1. (continued)
Unadjusted Analyses of Respiratory Variables by Group
(Original Comparisons Only)

| Variable | Statistic | Group | | | | Est. Relative Risk (95% C.I.) | p-Value |
|-------------------|-----------|------------|---------|---------------------|---------|-------------------------------|---------|
| | | Ranch Hand | | Original Comparison | | | |
| | | Number | Percent | Number | Percent | | |
| Asymmetrical Exp. | n | 1,015 | | 955 | | | |
| | Abnormal | 2 | 0.2 | 2 | 0.2 | 0.94 (0.16, 5.49) | 0.95 |
| | Normal | 1,013 | 99.8 | 953 | 99.8 | | |
| Hyperresonance | n | 1,015 | | 955 | | | |
| | Abnormal | 30 | 3.0 | 28 | 2.9 | 1.01 (0.60, 1.69) | 0.98 |
| | Normal | 985 | 97.0 | 927 | 97.1 | | |
| Dullness | n | 1,015 | | 955 | | | |
| | Abnormal | 2 | 0.2 | 0 | 0.0 | -- | 0.17 |
| | Normal | 1,013 | 99.8 | 955 | 100.0 | | |
| Wheezes | n | 1,015 | | 955 | | | |
| | Abnormal | 24 | 2.4 | 16 | 1.7 | 1.42 (0.76, 2.67) | 0.28 |
| | Normal | 991 | 97.6 | 939 | 98.3 | | |
| Rales | n | 1,015 | | 955 | | | |
| | Abnormal | 6 | 0.6 | 4 | 0.4 | 1.41 (0.42, 4.70) | 0.59 |
| | Normal | 1,009 | 99.4 | 951 | 99.6 | | |
| X ray | n | 1,012 | | 951 | | | |
| | Abnormal | 102 | 10.1 | 113 | 11.9 | 0.83 (0.63, 1.10) | 0.20 |
| | Normal | 910 | 89.9 | 838 | 88.1 | | |

TABLE R-2.

Adjusted Analyses of Respiratory Variables by Group
(Original Comparisons Only)

| Variable | Group | | Original Comparison | Adj. Relative Risk (95% C.I.) | p-Value | Covariate Remarks* |
|-------------------|-------|------|------------------------|----------------------------------|---------|---|
| | Ranch | Hand | | | | |
| Asthma | 1,012 | | 953 | **** | **** | PACKYR (p=0.02) GRP*PACKYR (p=0.03) |
| Bronchitis | 1,011 | | 953 | 0.91 (0.70, 1.18) | 0.44 | GRP*PACKYR (Borderline: p=0.09) |
| Pleurisy | 1,012 | | 952 | **** | **** | GRP*PACKYR (p=0.0006) |
| Pneumonia | 1,012 | | 952 | 0.97 (0.77, 1.22) | 0.74 | AGE (p=0.002) |
| Tuberculosis | 1,011 | | 953 | 1.32 (0.43, 3.98) | 0.60 | GRP*PACKYR (Borderline: p=0.06) |
| Thorax and Lungs | 1,011 | | 954 | 1.33 (0.88, 2.01) | 0.14 | AGE (p<0.0001) PACKYR (p<0.0001) |
| Asymmetrical Exp. | 1,011 | | 954 | 0.94 (0.16, 5.50) | 0.97 | AGE*PACKYR (Borderline: p=0.08) |
| Hyperresonance | 1,011 | | 954 | 1.00 (0.58, 1.74) | 0.87 | AGE (p<0.0001) PACKYR (p<0.0001) GRP*PACKYR (Borderline: p=0.09) |

TABLE R-2. (continued)

Adjusted Analyses of Respiratory Variables by Group
(Original Comparisons Only)

| Variable | Group | | Adj. Relative Risk (95% C.I.) | p-Value | Covariate Remarks* |
|----------|------------|------------------------|----------------------------------|---------|---|
| | Ranch Hand | Original Comparison | | | |
| Dullness | 1,011 | 954 | -- | -- | None |
| Wheezes | 1,011 | 954 | 1.43 (0.75, 2.76) | 0.25 | PACKYR (p<0.0006) |
| Rales | 1,011 | 954 | 1.42 (0.39, 5.18) | 0.59 | AGE*PACKYR (p=0.04) GRP*AGE (p=0.09) |
| X Ray | 1,008 | 950 | 0.86 (0.64, 1.16) | 0.31 | AGE (p<0.0001) PACKYR (p=0.02) GRP*PACKYR (Borderline: p=0.07) |

*Abbreviations

PACKYR: lifetime smoking history (pack-years)

GRP: group

TABLE R-3.

Summary of Group-by-Covariate Interactions for Respiratory Variables
(Original Comparisons Only)

| Variable | Interaction | Stratification | Statistic | Group | | | | p-Value |
|------------|--------------------|----------------|-----------|------------|---------|---------------------|---------|---------|
| | | | | Ranch Hand | | Original Comparison | | |
| | | | | Number | Percent | Number | Percent | |
| Asthma | Group-by-Pack-Year | 0 | n | 291 | | 268 | | |
| | | | Abnormal | 11 | 3.78 | 3 | 1.12 | |
| | | | Normal | 280 | 96.22 | 265 | 98.88 | 0.04 |
| | >0-10 | n | 284 | | 280 | | | |
| | | Abnormal | 16 | 5.63 | 12 | 4.29 | | |
| | | Normal | 268 | 94.37 | 268 | 95.71 | 0.46 | |
| Bronchitis | Group-by-Pack-Year | 0 | n | 437 | | 405 | | |
| | | | Abnormal | 17 | 3.89 | 27 | 6.67 | |
| | | | Normal | 420 | 96.11 | 378 | 93.33 | 0.07 |
| | >0-10 | n | 291 | | 268 | | | |
| | | Abnormal | 38 | 13.06 | 25 | 9.33 | | |
| | | Normal | 253 | 86.94 | 243 | 90.67 | 0.16 | |
| COPD | Group-by-Pack-Year | >0-10 | n | 284 | | 280 | | |
| | | | Abnormal | 38 | 13.38 | 40 | 14.29 | |
| | | | Normal | 246 | 86.62 | 240 | 85.71 | 0.75 |
| | >10 | n | 436 | | 405 | | | |
| | | Abnormal | 52 | 11.93 | 66 | 16.30 | | |
| | | Normal | 384 | 88.07 | 339 | 83.70 | 0.07 | |

TABLE R-3. (continued)

Summary of Group-by-Covariate Interactions for Respiratory Variables
(Original Comparisons Only)

| Variable | Interaction | Stratification | Statistic | Group | | | Adj. Relative Risk (95% C.I.) | p-Value | |
|--------------|--------------------|----------------|-----------|------------|---------|---------------------|-------------------------------|-------------------|--------|
| | | | | Ranch Hand | | Original Comparison | | | |
| | | | | Number | Percent | Number Percent | | | |
| Pleurisy | Group-by-Pack-Year | 0 | n | 291 | 267 | | | | |
| | | | Abnormal | 8 | 2.75 | 5 | 1.87 | 1.48 (0.50,4.37) | 0.49 |
| | | | Normal | 283 | 97.25 | 262 | 98.13 | | |
| | | | | | | | | | |
| | >0-10 | | n | 284 | | 280 | | | |
| | | | Abnormal | 18 | 6.34 | 4 | 1.43 | 4.67 (1.61,13.02) | <0.001 |
| Tuberculosis | Group-by-Pack-Year | 0 | n | 437 | 405 | | | | |
| | | | Abnormal | 21 | 4.81 | 36 | 8.89 | 0.52 (0.30,0.90) | 0.02 |
| | | | Normal | 416 | 95.19 | 369 | 91.11 | | |
| | | | | | | | | | |
| | >0-10 | | n | 290 | 268 | | | | |
| | | | Abnormal | 1 | 0.34 | 3 | 1.12 | 0.31 (0.05,2.34) | 0.28 |
| | | | Normal | 289 | 99.66 | 265 | 98.88 | | |
| | | | | | | | | | |
| | >0-10 | | n | 284 | 280 | | | | |
| | | | Abnormal | 4 | 1.41 | 0 | 0.00 | — | 0.05 |
| | | | Normal | 280 | 98.59 | 280 | 100.00 | | |
| | | | | | | | | | |
| >10 | | n | 437 | 405 | | | | | |
| | | Abnormal | 2 | 0.46 | 2 | 0.49 | 0.93 (0.16,5.42) | 0.92 | |
| | | Normal | 435 | 99.54 | 403 | 99.51 | | | |
| | | | | | | | | | |

TABLE R-3. (continued)

Summary of Group-by-Covariate Interactions for Respiratory Variables
(Original Comparisons Only)

| Variable | Interaction | Stratification | Statistic | Group | | Ranch Hand Number | Percent | Original Comparison | | Adj. Relative Risk (95% C.I.) | p-Value |
|---------------------|------------------------|----------------|-----------|-------|-----|----------------------|---------|------------------------|--|----------------------------------|---------|
| | | | | | | | | | | | |
| Hyper- resonance | Group-by- Pack-Year | 0 | n | 291 | 268 | | | | | | |
| | | | Abnormal | 2 | 0 | | | | | | |
| | | | Normal | 289 | 268 | | | | | | |
| | >0-10 | | n | 283 | 281 | | | | | | |
| | | | Abnormal | 8 | 3 | | | | | | |
| | | | Normal | 275 | 278 | | | | | | |
| Rales | | >10 | n | 437 | 405 | | | | | | |
| | | | Abnormal | 20 | 25 | | | | | | |
| | | | Normal | 417 | 380 | | | | | | |
| | Group-by- Age | Born >1942 | n | 384 | 341 | | | | | | |
| | | | Abnormal | 1 | 0 | | | | | | |
| | | | Normal | 383 | 341 | | | | | | |
| | | Born 1922-1942 | n | 600 | 577 | | | | | | |
| | | | Abnormal | 5 | 4 | | | | | | |
| | | | Normal | 595 | 573 | | | | | | |
| | | Born <1922 | n | 27 | 36 | | | | | | |
| | | | Abnormal | 0 | 0 | | | | | | |
| | | | Normal | 27 | 36 | | | | | | |

TABLE R-3. (continued)

Summary of Group-by-Covariate Interactions for Respiratory Variables
(Original Comparisons Only)

| Variable | Interaction | Stratification | Statistic | Group | | | | Adj. Relative Risk (95% C.I.) | p-Value |
|----------|--------------------|----------------|-----------|------------|---------|---------------------|-------------------|-------------------------------|---------|
| | | | | Ranch Hand | | Original Comparison | | | |
| | | | | Number | Percent | Number | Percent | | |
| X Ray | Group-by-Pack-Year | 0 | n | 290 | | 266 | | | |
| | | | Abnormal | 15 | 5.17 | 29 | 10.90 | 0.45 (0.24,0.85) | 0.01 |
| | | >0-10 | Normal | 275 | 94.83 | 237 | 89.10 | | |
| | | | n | 282 | | 281 | | | |
| | >10 | Abnormal | 28 | 9.93 | 26 | 9.25 | 1.08 (0.62, 1.89) | 0.79 | |
| | | Normal | 254 | 90.07 | 255 | 90.75 | | | |
| | | >10 | n | 436 | | 403 | | | |
| | | | Abnormal | 59 | 13.53 | 58 | 14.39 | 0.93 (0.63, 1.37) | 0.72 |
| | | | Normal | 377 | 86.47 | 345 | 85.61 | | |

OFFICERS

The statistically significant bronchitis-by-exposure-by-age-by-pack-year interaction ($p=0.009$) shown in Table 20-5 is described here in Table R-4.

TABLE R-4.
Cross Tabulation of Bronchitis- (Abnormal, Total) by-Exposure Index
Category-by-Age Category-by-Pack-Year Category for Ranch Hand Officers

| Pack-Years | Age | Exposure Index | | | | | |
|------------|----------------|----------------|---------------|----------|---------------|----------|---------------|
| | | Low | | Medium | | High | |
| | | Abnormal | Total Percent | Abnormal | Total Percent | Abnormal | Total Percent |
| 0 | Born >1942 | 4 | 21 19 | 0 | 10 0 | 1 | 3 33 |
| | Born 1922-1942 | 3 | 32 9 | 7 | 36 19 | 8 | 44 10 |
| | Born <1922 | 0 | 3 0 | 0 | 3 0 | 0 | 0 0 |
| >0-10 | Born >1942 | 1 | 14 7 | 2 | 7 29 | 0 | 0 0 |
| | Born 1922-1942 | 2 | 15 13 | 5 | 19 26 | 1 | 26 4 |
| | Born <1922 | 0 | 0 0 | 0 | 3 0 | 0 | 1 0 |
| >10 | Born >1942 | 0 | 3 0 | 2 | 4 50 | 0 | 4 0 |
| | Born 1922-1942 | 8 | 39 21 | 3 | 43 7 | 4 | 44 9 |
| | Born <1922 | 0 | 0 0 | 1 | 5 20 | 0 | 1 0 |

TABLE R-5.

Cross Tabulation of Pneumonia- (Abnormal, Total) by-Exposure Index Category-by-Age Category-by-Pack-Year Category for Ranch Hand Officers

R-10

The statistically significant hyperresonance-by-exposure-by-pack-year interaction (p=0.07) seen in Table 20-5 is tabulated in Table R-6.

TABLE R-6.

Cross Tabulation of Hyperresonance- (Abnormal, Total) by-Exposure Index Category-
by-Pack-Year Category for Ranch Hand Officers

| Pack-Years | Exposure Index | | | | | |
|------------|----------------|---------------|----------|---------------|----------|---------------|
| | Low | | Medium | | High | |
| | Abnormal | Total Percent | Abnormal | Total Percent | Abnormal | Total Percent |
| 0 | 0 | 56 | 0 | 49 | 1 | 47 |
| >0-10 | 0 | 29 | 1 | 29 | 1 | 27 |
| >10 | 5 | 42 | 1 | 52 | 0 | 49 |

The statistically significant thorax- and lung-by-exposure category interaction ($p=0.05$) shown in Table 20-5 is tabulated in Table R-7.

TABLE R-7.
Cross Tabulation of Thorax and Lung- (Abnormal, Total) by- Exposure
Index Category for Ranch Hand Officers

| | | Exposure Index | | | | | |
|---|-----|----------------|---------------|----------|---------------|----------|---------------|
| | | Low | | Medium | | High | |
| | | Abnormal | Total Percent | Abnormal | Total Percent | Abnormal | Total Percent |
| 9 | 127 | 7 | 3 | 130 | 2 | 5 | 123 |
| | | | | | | | 4 |

R-13

**Cross Tabulation of X Ray- (Abnormal, Total) by-Exposure Index Category-
by-Age Category-by-Pack-Year Category for Ranch Hand Officers**

| | | Exposure Index | | | | | | | |
|------------|----------------|----------------|---------------|----------|---------------|----------|---------------|----|-----|
| Pack-Years | Age | Low | | Medium | | High | | | |
| | | Abnormal | Total Percent | Abnormal | Total Percent | Abnormal | Total Percent | | |
| 0 | Born >1942 | 1 | 21 | 5 | 0 | 10 | 0 | 3 | 0 |
| | Born 1922-1942 | 3 | 32 | 9 | 1 | 36 | 3 | 44 | 5 |
| | Born <1922 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | |
| >0-10 | Born >1942 | 0 | 14 | 0 | 0 | 6 | 0 | 0 | |
| | Born 1922-1942 | 3 | 15 | 20 | 3 | 19 | 16 | 26 | 8 |
| | Born <1922 | 0 | 0 | | 1 | 3 | 33 | 1 | 0 |
| >10 | Born >1942 | 0 | 3 | 0 | 0 | 4 | 0 | 4 | 0 |
| | Born 1922-1942 | 7 | 39 | 18 | 7 | 43 | 16 | 44 | 5 |
| | Born <1922 | 0 | 0 | | 1 | 5 | 20 | 1 | 100 |

The statistically significant bronchitis-by-exposure-by-age-by-pack-year interaction ($p=0.005$) seen in Table 20-6 is tabulated in Table R-9.

Cross Tabulation of Bronchitis- (Abnormal, Total) by-Exposure Index Category-by-Age Category-by-Pack-Year Category for Ranch Hand Enlisted Flyers

| Pack-Years Age | | Exposure Index | | | | | | | | |
|----------------|------------|----------------|-------|---------|----------|-------|---------|----------|-------|---------|
| | | Low | | | Medium | | | High | | |
| | | Abnormal | Total | Percent | Abnormal | Total | Percent | Abnormal | Total | Percent |
| 0 | Born >1942 | 2 | 3 | 67 | 0 | 3 | 0 | 0 | 3 | 0 |
| | Born <1942 | 0 | 6 | 0 | 0 | 6 | 0 | 1 | 11 | 9 |
| >0-10 | Born >1942 | 1 | 4 | 25 | 1 | 6 | 17 | 2 | 2 | 100 |
| | Born <1942 | 1 | 13 | 8 | 1 | 9 | 11 | 0 | 7 | 0 |
| >10 | Born >1942 | 0 | 2 | 0 | 0 | 7 | 0 | 0 | 2 | 0 |
| | Born <1942 | 3 | 26 | 12 | 6 | 32 | 19 | 3 | 31 | 10 |

R-15

Cross Tabulation of Pleurisy- (Abnormal, Total) by-Exposure Index Category-by-Age Category-by-Pack-Year Category for Ranch Hand Enlisted Flyers

| | | Exposure Index | | | | | |
|------------|------------|----------------|-------|---------|----------|-------|---------|
| Pack-Years | Age | Low | | Medium | | High | |
| | | Abnormal | Total | Percent | Abnormal | Total | Percent |
| 0 | Born >1942 | 0 | 3 | 0 | 0 | 3 | 0 |
| | Born <1942 | 0 | 6 | 0 | 0 | 6 | 0 |
| >0-10 | Born >1942 | 1 | 4 | 25 | 0 | 6 | 0 |
| | Born <1942 | 1 | 13 | 8 | 1 | 9 | 11 |
| >10 | Born >1942 | 1 | 2 | 50 | 0 | 7 | 0 |
| | Born <1942 | 1 | 26 | 4 | 1 | 32 | 3 |
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The statistically borderline significant pneumonia-by-exposure-by-age interaction ($p=0.08$) shown in Table 20-6 is tabulated in Table R-11.

TABLE R-11.

Cross Tabulation of Pneumonia- (Abnormal, Total) -by-Exposure Index
Category-by-Age Category for Ranch Hand Enlisted Flyers

| Age | Exposure Index | | | | | |
|------------|----------------|---------------|----------|---------------|----------|---------------|
| | Low | | Medium | | High | |
| | Abnormal | Total Percent | Abnormal | Total Percent | Abnormal | Total Percent |
| Born >1942 | 4 | 9 | 2 | 16 | 0 | 7 |
| Born ≤1942 | 10 | 44 | 10 | 47 | 13 | 50 |
| | | 22 | | 21 | | 26 |

The statistically borderline significant hyperresonance-by-exposure-by-pack-year category interaction ($p=0.08$) shown in Table 20-6 is tabulated in Table R-12.

TABLE R-12.
Cross Tabulation of Hyperresonance- (Abnormal, Total) by-Exposure Index
Category-by-Pack-Year Category for Ranch Hand Enlisted Flyers

| Pack-Years | Exposure Index | | | | | |
|------------|----------------|---------------|----------|---------------|----------|---------------|
| | Low | | Medium | | High | |
| | Abnormal | Total Percent | Abnormal | Total Percent | Abnormal | Total Percent |
| 0 | 0 | 9 | 0 | 9 | 0 | 14 |
| >0-10 | 0 | 17 | 2 | 15 | 0 | 9 |
| >10 | 3 | 28 | 4 | 39 | 0 | 34 |

The statistically significant ($p=0.04$) thorax and lung-by-exposure interaction shown in Table 20-6 is tabulated in Table R-13.

TABLE R-13.
Cross Tabulation of Thorax and Lung Abnormalities- (Abnormal, Total)
by-Exposure Index Category for Ranch Hand Enlisted Flyers

| | | Exposure Index | | | | | |
|----------|-------|----------------|----------|--------|---------|----------|-------|
| | | Low | | Medium | | High | |
| Abnormal | Total | Percent | Abnormal | Total | Percent | Abnormal | Total |
| 7 | 54 | 13 | 10 | 63 | 16 | 2 | 57 |
| | | | | | | 4 | |

ENLISTED GROUND

The statistically significant asthma-by-exposure-by-age-by-pack-year interaction ($p=0.02$) shown in Table 20-7 is tabulated in Table R-14.

TABLE R-14.

Cross Tabulation of Asthma- (Abnormal, Total) by-Exposure Index Category-by-Age Category-by-Pack-Year Category for Ranch Hand Enlisted Groundcrew

| | | Exposure Index | | | | | | | | | | | |
|------------|----------------|----------------|-------|---------|--|----------|-------|---------|--|----------|-------|---------|--|
| Pack-Years | Age | Low | | | | Medium | | | | High | | | |
| | | Abnormal | Total | Percent | | Abnormal | Total | Percent | | Abnormal | Total | Percent | |
| 0 | Born >1942 | 1 | 24 | 4 | | 1 | 35 | 3 | | 1 | 15 | 7 | |
| | Born 1922-1942 | 0 | 18 | 0 | | 0 | 6 | 0 | | 0 | 9 | 0 | |
| | Born <1922 | 0 | 0 | | | 0 | 0 | | | 0 | 0 | | |
| >0-10 | Born >1942 | 0 | 37 | 0 | | 2 | 47 | 4 | | 4 | 36 | 11 | |
| | Born 1922-1942 | 1 | 16 | 16 | | 1 | 7 | 14 | | 0 | 13 | 0 | |
| | Born <1922 | 0 | 0 | | | 0 | 0 | | | 0 | 1 | 0 | |
| >10 | Born >1942 | 0 | 22 | 0 | | 4 | 46 | 9 | | 0 | 25 | 0 | |
| | Born 1922-1942 | 4 | 33 | 12 | | 0 | 21 | 0 | | 2 | 37 | 5 | |
| | Born <1922 | 0 | 3 | 0 | | 0 | 1 | 0 | | 1 | 5 | 20 | |

The statistically significant pleurisy-by-exposure-by-age interaction ($p=0.03$) shown in Table 20-7 is tabulated in Table R-15.

TABLE R-15.

Cross Tabulation of Pleurisy-(Abnormal, Total) by-Exposure Index Category-by-Age Category for Ranch Hand Enlisted Groundcrew

| Age | Exposure Index | | | | | |
|----------------|----------------|---------------|----------|---------------|----------|---------------|
| | Low | | Medium | | High | |
| | Abnormal | Total Percent | Abnormal | Total Percent | Abnormal | Total Percent |
| Born >1942 | 5 | 83 | 5 | 128 | 0 | 76 |
| Born 1922-1942 | 7 | 67 | 0 | 34 | 5 | 59 |
| Born <1922 | 0 | 3 | 0 | 1 | 0 | 6 |

The statistically significant wheeze-by-exposure-by-age interaction ($p=0.009$) shown in Table 20-7 is tabulated in Table R-16.

TABLE R-16.

Cross Tabulation of Wheezes- (Abnormal, Total) by-Exposure Index Category-by-Age Category for Ranch Hand Enlisted Groundcrew

| Age | Exposure Index | | | | | |
|----------------|----------------|---------------|----------|---------------|----------|---------------|
| | Low | | Medium | | High | |
| | Abnormal | Total Percent | Abnormal | Total Percent | Abnormal | Total Percent |
| Born >1942 | 2 | 83 | 1 | 127 | 3 | 76 |
| Born 1922-1942 | 1 | 67 | 3 | 34 | 2 | 59 |
| Born <1922 | 0 | 3 | 0 | 1 | 0 | 6 |

The statistically significant wheeze-by-exposure-by-pack-year interaction ($p=0.02$) shown in Table 20-7 is tabulated in Table R-17.

TABLE R-17.

Cross Tabulation of Wheezes- (Abnormal, Total) by-Exposure Index Category-by-Pack-Year Category for Ranch Hand Enlisted Groundcrew

| Pack-Years | Exposure Index | | | | | |
|------------|----------------|---------------|----------|---------------|----------|---------------|
| | Low | | Medium | | High | |
| | Abnormal | Total Percent | Abnormal | Total Percent | Abnormal | Total Percent |
| 0 | 0 | 42 | 0 | 41 | 0 | 24 |
| >0-10 | 2 | 53 | 3 | 53 | 1 | 50 |
| >10 | 1 | 58 | 1 | 68 | 4 | 67 |

The statistically borderline significant bronchitis-by-exposure category interaction ($p=0.08$) shown in Table 20-7 is tabulated in Table R-18.

TABLE R-18.
Cross Tabulation of Bronchitis- (Abnormal, Total) by-Exposure Index
Category for Ranch Hand Enlisted Groundcrew

| Exposure Index | | | | | | | | | |
|----------------|-------|---------|----------|-------|---------|----------|-------|---------|--|
| Low | | | Medium | | | High | | | |
| Abnormal | Total | Percent | Abnormal | Total | Percent | Abnormal | Total | Percent | |
| 25 | 153 | 16 | 19 | 163 | 12 | 11 | 141 | 8 | |

APPENDIX S

Glossary of Abbreviations

APPENDIX S: Glossary of Abbreviations

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TABLE S-1

GLOSSARY OF TECHNICAL AND MEDICAL ABBREVIATIONS

| | | | |
|----------|--|----------------------|--|
| -A- | | CHECO | - contemporary historical evaluation and combat operations |
| A | - replacement Comparisons interviewed by Air Force staff | CHOL | - cholesterol |
| ACA® | - Automated Chemical Analyser | CMI | - Cornell Medical Index |
| ACTH | - adrenocorticotrophic hormone | CNS | - central nervous system |
| AFHS | - Air Force Health Study | COPRO | - coproporphyrins |
| ALA | - delta-aminolevulinic acid | CPK | - creatine phosphokinase |
| ALKPHOS | - alkaline phosphatase | cpm | - counts per minute |
| -B- | | CUSUM | - cumulative sum |
| BA | - Bachelor of Arts | CV | - coefficient of variation |
| BMDP-4F® | - log-linear program | -D- | |
| BMDP-LR® | - logistic regression program | DBP | - diastolic blood pressure |
| BS | - Bachelor of Science | DNA | - deoxyribonucleic acid |
| BSL-2 | - National Institutes of Health Biosafety Level 2 | -E- | |
| BUN | - blood urea nitrogen | E | - erythema |
| -C- | | ECG | - electrocardiograph |
| CAD | - coronary artery disease | EEG | - electroencephalogram |
| CAP | - College of American Pathology | -F- | |
| CATI | - computer-aided telephone interview | FC | - fully compliant |
| CBC | - complete blood count | FEF ₂₅₋₇₅ | - forced midexpiratory flow rate |
| CFU | - colony forming unit | FEV | - forced expiratory volume |
| CHD | - coronary heart disease | FEV ₁ | - forced expiratory volume in one second |
| | | FIR CUSUM | - fast initial response cumulative sum |

TABLE S-1 (continued)

GLOSSARY OF TECHNICAL AND MEDICAL ABBREVIATIONS

| | | | |
|--------------------|---|-----------|---|
| FSH | - follicle stimulating hormone | ICD-9-CMD | - International Classification of Disease 9th Revision, Clinical Modification |
| FTA | - fluorescent treponemal antibody | | |
| FTI | - free thyroxine index | IQ | - intelligence quotient |
| FVC | - forced vital capacity | | |
| | -G- | | -K- |
| GED | - General Equivalency Diploma | K-S | - Kolmogorov-Smirnov |
| | | | -L- |
| GGTP | - gamma-glutamyl transpeptidase | LBBB | - left bundle branch block |
| GLUC | - glucose | LDH | - lactic dehydrogenase |
| | -H- | LH | - leuteinizing hormone |
| HB _s Ag | - hepatitis B surface antigen | | -M- |
| HCT | - hematocrit | MCH | - mean corpuscular hemoglobin |
| HD | - Hodgkin's Disease | MCHC | - mean corpuscular hemoglobin concentration |
| HDL | - high density lipoprotein | MCV | - mean corpuscular volume |
| HGB | - hemoglobin | MI | - myocardial infarction |
| HLA | - histocompatibility antigens | ML | - malignant lymphoma |
| HPF | - high-power field | MLC | - mixed lymphocyte culture |
| HRB | - Halstead-Reitan battery | MMPI | - Minnesota Multiphasic Personality Inventory |
| | -I- | MMPID | - MMPI depression scale |
| I | - induration | | -N- |
| IARC | - International Agency for Research on Cancer | NIOSH | - National Institute for Occupational Safety and Health |
| ICD | - International Classification of Disease | | |

TABLE S-1 (continued)

GLOSSARY OF TECHNICAL AND MEDICAL ABBREVIATIONS

| | | | |
|------|---|----------|--|
| NC | - noncompliant | PULM | - FEV ₁ /FVC ratio |
| NCI | - National Cancer Institute | PULSE | - pulse index |
| NCVA | - nerve conduction velocity above the ankle | PWM | - pokeweed mitogen |
| NCVE | - nerve conduction velocity above the elbow | | -Q- |
| NHL | - non-Hodgkin's lymphoma | QA | - quality assurance |
| NKC | - natural killer cell | QC | - quality control |
| NORC | - National Opinion Research Center | QRC | - Quality Review Committee |
| NOS | - not otherwise specified | | -R- |
| | -O- | R | - replacement Comparisons |
| O | - original Comparisons | RBBB | - right bundle branch block |
| OMR | - Optical Mark Recognition | RBC | - red blood cell |
| | -P- | RIA | - radioimmunoassay |
| PBM | - peripheral blood mononuclear | RPR | - rapid plasma reagin |
| PC | - partially compliant | RVN | - Republic of Vietnam |
| PCB | - polychlorinated biphenyl | | -S- |
| PCT | - porphyria cutanea tarda | S | - shifted original Comparisons |
| PHA | - phytohemagglutinin | SAIC | - Science Applications International Corporation |
| PLAT | - platelet count | SAS® | - Statistical Analysis System |
| PLT | - platelet count | SAS®-GLM | - Statistical Analysis System general linear model |
| PMR | - proportionate mortality ratio | SCRf | - Scripps Clinic and Research Foundation |
| POMS | - profile of mood states | SEA | - Southeast Asia |
| PTSD | - post-traumatic stress disorder | | |

TABLE S-1 (continued)

GLOSSARY OF TECHNICAL AND MEDICAL ABBREVIATIONS

| | | | |
|----------------|---|------|-------------------------------------|
| SED | - sedimentation rate | | -W- |
| SEMEN | - semen count | WAIS | - Wechsler Adult Intelligence Scale |
| SGOT | - serum glutamic-oxaloacetic transaminase | WBC | - white blood cell |
| SGPT | - serum glutamic-pyruvic transaminase | | |
| SIRL | - Scripps Immunology Reference Laboratory | | |
| SKIN | - skin index | | |
| STS | - soft tissue sarcoma | | |
| -T- | | | |
| T ₃ | - triiodothyronine | | |
| T ₄ | - total thyroxine | | |
| TBILI | - total bilirubin | | |
| TCDD | - 2,3,7,8-tetrachlorodibenzo-p-dioxin | | |
| TEST | - testosterone | | |
| TLC | - total lymphocyte count | | |
| TSH | - thyroid stimulating hormone | | |
| -U- | | | |
| USG | - urine specific gravity | | |
| -V- | | | |
| VA | - Veterans Administration | | |

TABLE S-2.

Glossary of Covariate and Statistical Abbreviations

| | | | |
|------------|--|---------|---|
| -A- | | d.f. | - degrees of freedom |
| ALC | - current alcohol use (drinks/day) | DIAB | - diabetic class |
| Adj. RR | - adjusted relative risk | DIFCORT | - differential cortisol |
| -B- | | DRKYR | - lifetime alcohol history (drink-years) |
| BATCH | - batch-to-batch variation among examination groups | -E- | |
| BUN | - blood urea nitrogen | EDUC | - education |
| -C- | | Est. RR | - estimated relative risk |
| C.I. | - confidence interval | -G- | |
| CC | - continuous dependent variable, adjusted by continuous covariates | GRP | - group |
| -D- | | -H- | |
| CD | - continuous dependent variable, adjusted by discrete covariates | H | - high exposure index level |
| CHOL | - cholesterol | HDL | - high density lipoprotein cholesterol |
| CHOL/HDL | - cholesterol to HDL ratio | -I- | |
| CI | - combat index | IC | - exposure to industrial chemicals |
| CSMOK | - current smoking (packs/day) | INS | - exposure to insecticides |
| -D- | | -L- | |
| DAY(BATCH) | - blood-draw day variation within batch | L | - low exposure index level |
| DC | - exposure to degreasing chemicals | LAT | - average lifetime residential latitude |
| DD | - discrete dependent variable, adjusted by discrete covariates | LOG | - logarithmic |

TABLE S-2. (continued)

Glossary of Covariate and Statistical Abbreviations

-M-

M - medium exposure index level

-N-

NS - not significant

-O-

OCC - occupation

OR - odds ratio

-P-

PACKYR - lifetime smoking history (pack-years)

%BFAT - percent body fat

PERSTYPE - personality type

PS - personality score

PTSD - post-traumatic stress disorder

-R-

RR - relative risk

-S-

SE - standard error

SEA ACNE - presence of pre-SEA acne

SKIN - skin color

SQRT - square root

SUNREAC - sun-reaction index

-W-

WINE - wine consumption

EWID
DATE
FILMED
3-1988
DTIC